Boston Public Library

No 4490a 262

1917
~~1720-1742~~
Irregular
Oct.
Dec.

THE TRUSTEES OF THE PUBLIC LIBRARY
OMNIVM LVX CIVIVM
OF THE CITY OF BOSTON
1852 1878

GIVEN BY
University of Texas

1720-1742

4490a262

B104-617-3m

University of Texas Bulletin

No. 1720: April 5, 1917

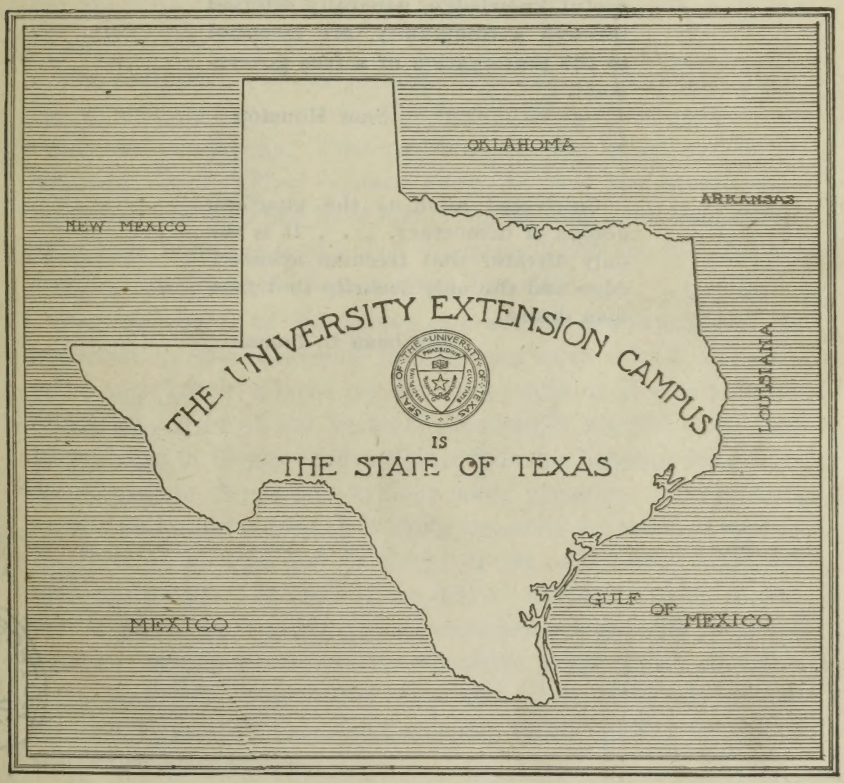
DEPARTMENT OF EXTENSION

The Uses of the Peanut on the Home Table

BY

JESSIE P. RICH

Formerly of the Department of Extension, Division of Home Welfare



Published by the University six times a month and entered as second-class matter at the postoffice at AUSTIN, TEXAS

1917-2

4490a
.262
no. 1720-1742
1917

The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston

Cultivated mind is the guardian genius of democracy. . . . It is the only dictator that freemen acknowledge and the only security that freemen desire.

Mirabeau B. Lamar

The Uses of the Peanut on the Home Table

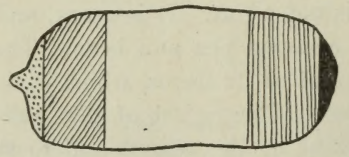
The peanut is not a nut. We have too often thought of the peanut as a part of the circus or street parade, and have been misled by the latter half of its name and used it as we would nuts. The peanut is not a nut. It is a pea, and belongs to the same family as the common pea and bean. The term *nut* was applied to it on account of its flavor, which is similar to that of many of the true nuts. The object of this bulletin is to point out the true food value of the peanut and to show how it can be used in our dietary.

The composition of the peanut. The peanut deserves to hold the same high rank among the foodstuffs used by man as do beans and other peas. Peanuts, like peas and beans, are a concentrated food. They contain more fat and less starch than the other legumes, but have about the same amount of protein, or muscle building food. The diagrams illustrate the comparative composition of these various legumes.

The high value of the peanut as a muscle building food. As indicated by the diagrams, the legumes have a high nutritive value and contain a large per cent of protein or muscle building substance. Few of our vegetable foodstuffs contain more than 10 per cent to 15 per cent protein, while the legumes have from 20 per cent to 30 per cent in their many varieties. The protein, or muscle building food, is a daily necessity in our diet and in the form of meat or eggs or cheese, is one of the most expensive food substances. The use of the peanut which is so rich in protein is therefore strongly to be recommended to those to whom economy is important. It is, especially when raised at home, a comparatively cheap source of protein. The following diagram illustrates the food value and economy of the peanut compared with other staple foods.

PEANUT

(NOT A TRUE NUT)



PERCENTAGE COMPOSITION

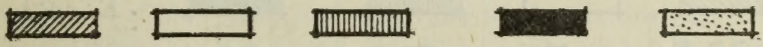
25.8	38.6	22.4	2.0	9.2
PROTEIN	FAT	CARBOHYDRATES	ASH	WATER

FUEL VALUE

2500 CALORIES PER POUND.

DRIED PEA

PERCENTAGE COMPOSITION



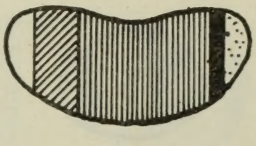
21.0 PROTEIN · 1.8 FAT · 55.4 CARBOHYDRATES · 2.6 ASH · 13.0 WATER

FUEL VALUE

1611 CALORIES

PER POUND

DRIED BEAN



PERCENTAGE COMPOSITION

25.5 1.7 50.9 3.3 13.1

PROTEIN · FAT · CARBOHYDRATES · ASH · WATER ·

FUEL VALUE

1565 CALORIES PER POUND

FOOD VALUE OF THE PEANUT COMPARED WITH OTHER STAPLE FOODS.

Staple Foods	Assumed Cost per Pound	Cost of 1,000 Calories of Energy	Amount for 10c			
			Fat	Protein	Carbohydrates	Energy Calories
	Cents	Cents	Lbs.	Lbs.	Lbs.	
Peanuts	7.00	3.06	.45	.31	.20	2,767
Porterhouse steak	25.00	22.05	.07	.07		444
Whole milk	.05	12.00	.10	.08	.13	815
Beans, dried	.05	3.01	.03	.45	1.19	3,210
Potatoes	.02	6.04		.09	.74	1,550
Cheese	16.00	7.05	.23	.17	.03	1,330

10c worth of peanuts have a calorie value equal to { 62c worth of steak. / 34c worth of milk. / 20c worth of cheese. / 18c worth of potatoes. / 9c worth of beans.

Peanuts are not indigestible if properly used. Peanuts are thought by many to be indigestible. They have gained this reputation because usually they have been improperly prepared and eaten in large quantities after a hearty meal or between meals, or late at night. They are, as a rule, poorly masticated. The peanut therefore has caused digestive troubles and fallen into disrepute because of its abuse rather than its use.

Rules for preparing peanuts. The peanut, in order to be properly digested, should be regarded as a rich leguminous food, should be properly prepared, and used only in its proper place as any other member of the legume family is used. In the use and preparation of the peanut, the following things should be kept in mind: (1) Peanuts are high in protein and consequently take the place of meat in the dietary. (2) Peanuts are high in fats and can be used in place of other fats. For example: peanut sandwiches may be prepared without the addition of butter, and peanut bread does not need shortenings as the peanut furnishes a sufficient quantity of fat in both instances. (3) Peanuts contain raw starch and therefore must be cooked before they are digestible. They can be parched as roasted peanuts, or they may be prepared as are the peas and beans. The same pleasant flavor does not develop, however, when they are cooked in the latter way. (4) Peanuts are a highly concentrated food and should be thoroughly broken up before reaching the stomach. This may be accomplished by thorough mastication or by chopping or

grinding. When a food substance reaches the stomach in a state of fine division it is more quickly digested and more thoroughly utilized.

Reasons for using peanuts in the dietary. There are many reasons why the peanut should be a valued food, especially in Texas. (1) They are easily produced on the farm, and hence are very economical. (2) They can be easily kept for long periods. (3) Many products can be made from them, such as peanut butter, peanut meal, peanut oil and peanut flour, hence they offer a pleasing variety in the dietary. (4) They are a valuable and convenient food for school children. The peanut butter sandwich, once or twice a week in the dinner pail is better than the thick slice of ham or fried pork. A bowl of hot peanut soup for the noon luncheon at school will go further in giving strength to prepare the afternoon recitations than the customary cold meat, cold fried eggs, and soggy biscuit. In using the peanut in the dietary of children, it should be ground or pounded to insure a thorough breaking up. (5) Peanuts are a good substitute for meat. Meat should not be eaten at every meal. Eating too much meat causes many of our common ills.

RECIPES.

The following recipes indicate a few of the ways in which peanuts may be used as a food in the home:

Peanut Butter.

By a little experience and the aid of a small meat grinder, anyone can make good peanut butter for home use. The peanuts may be roasted before or after shelling, but in either case the oven should be only moderately hot and the peas should be stirred frequently. After roasting, rub off the skins. In grinding use the finest plate on the grinder and screw up the tension until the crank will be quite hard to turn. If the pulp is too coarse after one grinding, it may be run through a second time. It will not be necessary to add anything but a little salt to the butter, but, if desired, the butter may be thinned by the addition of a little olive or peanut oil. The peanut butter made this way will, if kept in a cool place, keep several weeks, but will not keep

indefinitely. There are on the market grinders made especially for preparing peanut butter. These grinders do not crush so many of the oil cells in the peanut and the butter keeps fresh a longer time. Should you wish to perfect the making of peanut butter in the home, write The Department of Agriculture, Washington, D. C., for The Farmers' Bulletin No. 431, on "The Peanut," by W. R. Beattie.

Nut Bread.

2½ cups of flour.*
2½ teaspoons baking powder.
1 teaspoon salt.
⅓ cup of sugar.
⅔ cup of milk.
1 egg, well beaten.
1 cup chopped roasted peanuts.

Sift flour and baking powder; add salt, sugar, and nut meats. Beat egg well, add milk to it and mix with dry ingredients. Put in pan and allow to stand ten minutes. Bake in moderate oven.

Peanut Biscuit.

2 cups flour.
¾ cup of ground roasted peanuts.
4 teaspoons baking powder.
1 teaspoon salt.
¾ cup of milk.

Sift salt, flour and baking powder together. Add nuts and milk to make a stiff dough. Roll on a floured board to about ¼ inch thickness, cut and bake in a hot oven.

Peanut Buns.

Use the baking powder biscuit dough, the recipe for which is given below. Roll to about ⅛ inch thickness; cut into pieces about three inches square, place a tablespoon of peanut butter in the center; fold up the sides about it and bake.

*All measures in this and all other recipes are level measures.

(These are convenient and good sandwiches for the lunch basket.)

Baking Powder Biscuit.

2 cups of flour.
4 level teaspoons baking powder.
1 teaspoon salt.
2 to 4 tablespoons shortening.
¾ cup of milk.

Sift flour, baking powder and salt and put in fat. Add milk, stirring as little as possible. Pat into shape on floured board, roll ¼ inch thick, cut and bake.

Peanut Milk Toast.

Toast six slices dry bread.
Butter toast with peanut butter.
Make thin white sauce and turn over bread.

White Sauce.

1½ tablespoons flour.
2 table spoons butter.
1 cup of milk.
½ tablespoon salt.

Put butter in saucepan, stir until melted and bubbling; add flour and salt and stir until well blended. Pour on gradually the milk, adding about one-third at the time until well mixed, then beat until smooth and glossy. If a wire wisk is used all the milk may be added at one time.

Peanut Sandwiches.

1. Shell and peel off inner skin of roasted peanuts, then chop very fine and stir them quickly in mayonnaise dressing and spread between thin slices of bread.
2. Shell and peel off inner skin of roasted peanuts, then chop very fine and spread them quickly on slices of buttered bread; sprinkle lightly with salt before putting slices together.

3. Shell and peel off inner skin of roasted peanuts, then chop very fine and mix with enough cream cheese to hold them together; season and spread this on good sized square crackers or bread and serve with lettuce salad, or as a luncheon sandwich.

4. Follow same directions for preparing nuts as given in 1, 2 and 3. Add enough salad oil to make a smooth paste; add lemon juice in the proportion of $\frac{2}{3}$ spoon of lemon juice to 3 spoons of olive oil. Salt to taste and use as sandwich filling.

5. Dilute 4 tablespoons peanut butter with 3 tablespoons boiling water. Add $\frac{1}{4}$ teaspoon salt. Beat well and spread on thin slices of bread.

Peanut Soup No. 1.

1½ pints of peanuts.
3 quarts of water.
1 bay leaf.
½ cup celery.
1 slice of onion.
1 quart of milk.

Peanut soup is made like a dried pea soup. Soak peanuts over night in two quarts of water; in the morning drain, add remaining water, bay leaf, celery and onions; boil this slowly four or five hours, stirring frequently to prevent burning, or boil fifteen minutes and place in fireless cooker over night. Rub through sieve and return to fire. When again hot add the milk and let the soup boil up; then season and it is ready to serve.

Peanut Soup No. 2.

2 tablespoons butter.
2 tablespoons flour.
4 cups of milk.
1 cup roasted peanuts, or
½ cup peanut butter.
1½ teaspoons of salt.

Run peanuts through food chopper. Make a thin white sauce of the butter, flour, milk and salt as per directions given under

"Peanut Milk Toast." Add chopped peanuts to the sauce. Bring to a boil and serve at once. Where the butter is used, thin it gradually with a part of the sauce to prevent lumping.

Baked Peanuts.

1 quart raw shelled peanuts.
¼ cup of molasses.
1 tablespoon of salt.
¼ tablespoon of ginger.
Water.

Blanch one quart of raw shelled peanuts by dipping in hot water until the skins can be rubbed off with the fingers. Soak over night. In the morning boil for twenty minutes; add ¼ cup of molasses, 1 tablespoon of salt, ¼ tablespoon of ginger. Put in bean pot, covered with water, and bake slowly for four or five hours, or until tender. Or put into fireless cooker for five to seven hours, and remove to oven for thirty minutes to brown done.

Any baked peanuts left over may be rubbed through a sieve and used for making soup.

Peanut Turnips.

Slice turnips in rounds, throw into rapidly boiling water or meat stock and cook until tender. Place layer of turnips in bottom of buttered baking dish, sprinkle over these chopped roasted peanuts, and pour over this peanut butter thinned with warm water to consistency of cream. Repeat until dish is filled. Cover with bread crumbs. Season each layer with salt and pepper. Bake in the oven for about fifteen minutes, basting every little while with peanut butter thinned with a little hot water.

Peanuts and Rice.

¾ cup uncooked rice.
1 cup chopped roasted peanuts.
1 pint white sauce.

Boil rice until thoroughly tender in salted *boiling* water and

drain. Make a cream sauce, using one pint of milk, four tablespoons of butter and four tablespoons of flour. Heat the butter, stir in the flour, and cook a few minutes (be careful not to burn); then add the milk, heated. Boil for three minutes and season with one teaspoon of salt. Put bits of butter in the bottom of a baking dish or pan, add about half the rice, a generous sprinkling of peanuts, and about half the cream sauce. Repeat this, beginning with the butter, then the rice, cheese, and cream sauce. Cover with bread crumbs and brown in a hot oven. Serve at once. Where one is in a hurry or the oven is not hot, simply add peanuts to the white sauce and turn this over the cooked rice.

Potato and Peanuts.

6 medum sized cold boiled potatoes.
2 cups white sauce.
1 cup chopped roasted peanuts, or ½ cup peanut butter may be used.

White Sauce.

4 tablespoons butter.
4 tablespoons flour.
2 cups milk.

Cut cold potatoes into cubes and mix with white sauce, to which the peanuts have been added. Put in a buttered baking dish, cover with bread crumbs, heat in oven until crumbs are light brown. Serve in baking dish.

Peanut Loaf 1.

1 cup roasted peanuts.
2 cups bread crumbs.
¼ cup melted butter.
½ teaspoon onion juice.
1 egg.
½ teaspoon salt.
¼ teaspoon pepper.
Milk.

To the peanuts, bread crumbs, melted butter, beaten egg, onion juice, salt and pepper, add enough milk to make a moist

loaf. Stir all these well together and add more seasoning if required. Put into a buttered tin or mold, bake for one hour in a moderate oven, covering the first half of the time. During the cooking, baste three times with melted butter. Turn out on a hot dish, sprinkle with chopped peanuts and serve with brown sauce.

Peanut Loaf 2.

1 large potato.
1 cup roasted peanuts.
1½ cups bread crumbs.
2 eggs.
2 tablespoons butter.
1 small onion.
1 cup hot water.
1 pint strained tomatoes.
1 teaspoon salt.

Grind the nuts, potato and onion. Add hot water, crumbs, butter, and salt, form in loaf, place in pan and turn. Pour tomato juice over it. Bake in moderate oven, occasionally basting with the tomato juice.

Peanut Macaroni.

1 cup macaroni.
2 cups medium white sauce.
½ cup peanut butter.
½ teaspoon salt.

Wash and break macaroni into short lengths, cook in salted boiling water until tender. Make medium thick white sauce and carefully add peanut butter. Put bits of butter in bottom of baking dish, add a layer of macaroni, cover with sauce and repeat; cover with crumbs and brown in a quick oven. Serve hot.

White Sauce.

2 tablespoons butter.
2 tablespoons flour.
1 cup milk.
½ teaspoon salt.

Melt butter, add flour and cook three minutes. Then add milk

gradually, stirring until it thickens. Add salt just before serving.

Tomatoes Stuffed With Peanuts.

6 ripe tomatoes.
½ cup bread crumbs or cooked rice.
½ cup chopped roasted peanuts.
1 teaspoon salt.
1 tablespoon butter.

Peel tomatoes, slice off top, and scoop out the center. Mix this center with crumbs, peanuts, salt and butter. Sprinkle inside of tomato with salt, fill with the mixture, replace top, and bake on a buttered ring of toast or slice of cold molded rice.

Brown Sauce.

2 tablespoons butter.
½ slice of onion.
3 tablespoons flour.
1 cup brown stock.
¼ tablespoon salt.
⅛ tablespoon pepper.

Cook onions in butter until slightly browned; remove onion and stir butter constantly until well browned; add flour mixed with the seasoning, and stir until brown; add stock gradually and cook until it begins to thicken.

Peanut Chops.

4 tablespoons peanut butter.
6 tablespoons cream.
1 egg.
6 slices of bread.
Cracker crumbs.

Trim all crusts off the bread, spread the bread with peanut butter; cut each slice into three oblong pieces; beat the egg and add the cream. Dip the bread into the egg and cream mixture

and then into the cracker crumbs. Place in a greased pan and bake in a hot oven until brown.

Banana and Peanut Salad.

Banana	Chopped roasted peanuts.
Lettuce	Mayonnaise.

Place ½ banana on lettuce leaf, sprinkle with chopped nuts, and serve with mayonnaise.

Lettuce with Peanut Dressing.

Lettuce.	Peanut butter dressing.

Crisp lettuce leaves. Serve with peanut butter dressing.

Peanut Butter Dressing.

2 eggs, beaten.
4 tablespoons vinegar.
2 tablespoons peanut butter.
4 tablespoons sugar.
1 teaspoon salt.
1 cup cream, whipped.

Cook together the vinegar, eggs, sugar, salt and peanut butter: cool. Add cream and serve on head of lettuce.

Peanut Cake.

¼ cup butter.
½ cup peanut butter thinned with ¼ cup milk.
2 cups sugar.
3 cups flour.
4 eggs.
1 cup of milk.
3 teaspoons baking powder.
½ teaspoon salt.

Melt butter, add peanut butter thinned with milk. Stir in

sugar, add egg yolks, milk and flour and stir well. Beat egg whites and fold into cake. Bake in layers as a loaf. Frost.

Coarsely ground peanuts may be added to White Mountain Frosting and used to ice a simple cake.

White Mountain Frosting.

1 cup sugar
⅓ cup boiling water
White of one egg.
1 teaspoon vanilla or ½ teaspoon lemon juice.

Put sugar and water in sauce pan and stir to prevent sugar from sticking to pan. Heat gradually to boiling point and boil without stirring until syrup will thread when dropped from spoon. Pour syrup gradually on beaten whites of eggs and continue beating until right consistency to spread.

Peanut Cookies.

2 tablespoons butter.
¼ cup of sugar.
1 egg.
¼ teaspoon salt.
1 teaspoon baking powder.
½ cup chopped roasted peanuts.
½ cup flour.
2 tablespoons milk.
½ tablespoon lemon juice.

Cream the butter, add the sugar and beaten eggs. Sift the flour and baking powder, add to the other ingredients. Then add milk, peanuts and lemon juice and stir until thoroughly mixed. Drop from teaspoon on buttered sheets one inch apart and place a half peanut on each. Bake twelve to fifteen minutes in a slow oven.

Peanut Candy.

1 cup sugar.
½ cup chopped roasted peanuts.

Heat the sugar in a hot oven or stir over the fire until melted. When it is melted move to the back of range and add peanuts, mixing them thoroughly with the syrup. Spread on a tin and

press into shape with knives. (The tin does not need greasing.) Cut into bars at once, as it hardens rapidly.

Salted Peanuts.

Blanch the jumbo peanuts. Heat 1 cup of Wesson's salad oil and drop in ⅓ cup nuts. Cook until a delicate brown color, remove to unglazed paper and sprinkle with salt.

B118-717-8m

University of Texas Bulletin

No. 1721: April 10, 1917

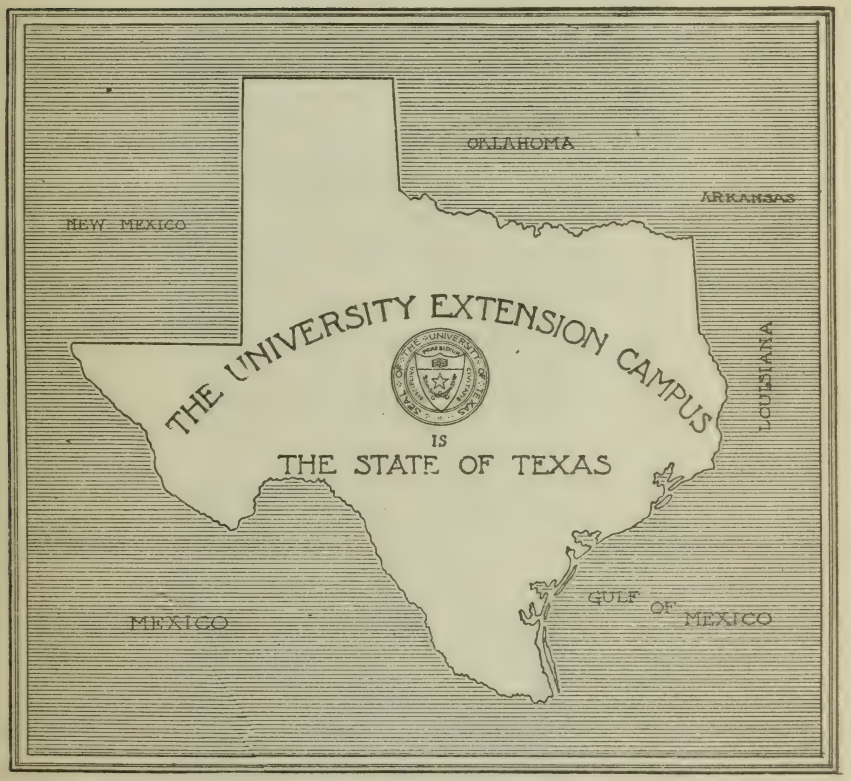
The University Interscholastic League

Constitution and Rules for County, District and State Contests in Debate, Declamation, Spelling, Essay-Writing and Athletics

EDITED BY

E. D. SHURTER

State Chairman



Published by the University six times a month and entered as second-class matter at the postoffice at

AUSTIN, TEXAS

The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston

Cultivated mind is the guardian genius of democracy. . . . It is the only dictator that freemen acknowledge and the only security that freemen desire.

President Mirabeau B. Lamar.

DELEGATES TO THE STATE MEET IN 1917, IN FRONT OF THE CAPITOL

CLASS B HIGH SCHOOL TRACK MEET, 1917

INDEX OF CONTENTS.

	Page
Age limit of contestants	21
Athletic rules	51
Baseball, rules in	52
Baskett ball, rules in	52
Championships, all-round	27
City schools, classification of	20
City schools: when they may send separate representatives to district contests	20
Contests held by the League	19
Contests, who may enter	21
Contests, relations between county, district, and State	25
County contests	14
Debate, rules in	32
Declamation, rules in	36
Disputes	29
District contests	14
Districts and district directors	14
Divisions: Junior, Senior, Class A, Class B	21
Eligibility rules for all contests	23
Essay-writing, rules in	43
Expenses and rebates for final State meeting	28
Football, rules in	51
Girls, Contests for	19
Track and field events for	55
Industrial contests	48
Junior contests: Eligibility to	21
Junior declamation	40
Junior division in track and field events	56
Junior high schools	9
Membership in League	11
Officers and duties	13
Officials for athletic contests	51
Prizes for State contests	62
Records in State contests	72
Reports and press notices	27
Rural school, definition of	9
Rural school division in declamation	22
Senior division	22
Spelling, rules in	45
State contests	19
Tennis, rules in	54
Track, rules in	54
Track meet, junior division	56
Track meet, Class A and Class B divisions	57
Track representation to final meet	26
Track, rules for State meet	57
Ward school, definition of	9

INTRODUCTION.

What is now known as the University Interscholastic League was organized in December, 1910, at the State Teachers' Meeting at Abilene. For the first year the League's activities were confined to debates among the high schools affiliated with the University. The following year contests in declamation were added and membership in the League was thrown open to all the schools of the State below college rank. Subsequently there were also added contests in spelling, essay writing, and athletics

The purpose of the Interscholastic League is to organize and direct desirable school activities, and thereby assist in preparing pupils for citizenship. The organization should have the active cooperation of every school teacher in Texas, and *every school in Texas,* no matter how small, should become an active member.

In 1911 a total of 28 schools paid the annual membership fee; 128 schools joined the League in 1912; 248 in 1913; 503 in 1914; 810 in 1915; 1296 in 1916; 2268 in 1917. It is hoped and expected that during the coming year fully 3000 schools will join for participation in one or more of the various contests in debate, declamation, essay writing, and athletics. Will *your* school be one of the members? Surely it will—if you are a live teacher.

Special attention is called to the following matters:

1. The largest cities of the State are now placed in districts by themselves. This has made necessary some reorganization of the districts generally.

2. For the benefit particularly of rural schools, a separate division in declamation has been established for rural schools (schools having no more than two teachers). There will be separate contests for boys and for girls, but no Junior and Senior subdivision. Rural schools may also enter the other declamation contests, as formerly.

3. Declamations on any particular subject are not required this year. The boys' and girls' Senior declamations, the boys' Junior declamations, and the declamations for rural school pupils, are to be prose selections on any subject chosen, pro-

vided they conform to the general rule as to the character of declamations. Girls' Junior declamations are to consist of selections from standard poetry.

4. The Junior high schools in cities are placed in the Class B High School Division in track.

5. The complete athletic rules are not printed in this bulletin. You are referred to the official A. A. U. rules, Spaulding's Athletic Library, Spaulding Bros., Dallas, Texas, for rules governing all athletic contests of the League.

6. Optional industrial contests are provided for the county meetings.

7. The matter of allowing girls representation on the debating teams is deferred until next year. This question will be presented for determination at the annual meeting of the League, to be held during the general sessions' program of the State Teachers' Association.

8. As the membership of the League increases, emphasis should more and more be placed on the county meetings. The main thing to work for is to get a good live county organization and the subsequent district and State contests will take care of themselves. Such an organization should be perfected at the County Institute, and an hour or more set aside in the program for the discussion of the work and plans for the year.

9. District and county officers, county superintendents, and *all* teachers interested, should make special efforts to increase the League's membership among the rural schools; first, because these are the schools that most need the contact with and assistance of the State organization; and, secondly, because a material increase in the membership fee fund is necessary for the highest success of the League as a whole.

10. In conformity with a referendum vote, the annual membership fee in the League is now graded for different classes of schools as follows: Class A high schools, $3.00 (see "Definitions," page 9); schools having three or more teachers and not defined as Class A high schools, $2.00; schools having not more than two teachers, $1.00.

11. Bear in mind that these contests are only a means to an end—the preparation of students for citizenship. The mere

fact of winning should therefore not be taken too seriously. Teachers as well as pupils should learn how to lose as well as how to win.

12. Debating squads composed of University students can usually be sent to debate the League question, when desired, provided a given school or community can arrange to defray the traveling expenses of the two speakers belonging to a squad.

13. Arrangements have been made with the publisher of the *Texas School Journal* for an interscholastic League page. Watch the columns of that magazine for special announcements. The Department of Extension will also issue a monthly or semi-monthly bulletin entitled "The Interscholastic Leaguer," which will be sent to all League members.

Let us hear from you regarding the conditions in your locality and whenever any question arises regarding the following rules. However, please first look through the rules carefully to see if questions that you might wish to ask are not answered herein.

DEFINITIONS.

1. *Rural School.*—By the term "rural school," wherever used in the Constitution and Rules of the League, is meant a school with not more than two teachers and not located in an incorporated town.

2. *Ward School.*—A ward school shall constitute a separate member of the League if such school comprises the first seven grades, or any subdivision thereof, and is under a separate principal and in a separate building from the high school.

3. *High School.*—A high school is one having at least one teacher who is devoting the whole of his or her time to instruction above the seventh grade.

4. *Junior High School.*—A junior high school is one carrying work not above the ninth grade, and located in a city having a main or central high school.

5. *Junior and Senior Divisions.*—The age limit for junior boys and for junior girls is 15. No one over the age limit on the first day of the preceding September shall enter into the junior contests in any event. Furthermore, the following are

also prohibited from entering the junior contests, except in athletics:

(a) Pupils in all schools except rural schools who have been promoted to the ninth grade.

(b) Pupils in a main or junior high school in a city having one or more complete ward schools. (See definitions above.)

6. *Class A High School.*—A Class A high school is one located in a district having 600 or more white scholastics.

7. *Class B High School.*—A Class B high school is one located in a district having less than 600 white scholastics.

CONSTITUTION AND RULES OF THE UNIVERSITY INTERSCHOLASTIC LEAGUE.

ARTICLE I.

Name.

This organization shall be known as The University Interscholastic League.

ARTICLE II.

Object.

The object of this League is to foster in the schools of Texas the study and practice of public speaking and debate as an aid in the preparation for citizenship; to assist in organizing, standardizing, and controlling athletics in the schools of the State; and to promote county, district, and State interscholastic contests in debate, declamation, spelling, essay writing, and athletics.

ARTICLE III.

Membership.

SECTION 1. Any public or private school in Texas that is below collegiate rank is eligible to membership in this League, except:

(a) No private school is eligible to membership if it calls itself a college, or confers a degree, or is ranked as a college by the University of Texas authorities.

(b) No school of oratory or preparatory department of a college is eligible to membership.

SEC. 2. To become a member of this League, a school shall pay an annual membership fee to E. D. Shurter, Chairman, University, Austin, Texas. The membership fee shall be graded for different classes of schools as follows: All Class A high schools, $3.00 (See Definitions, page 9); schools having three or

more teachers and not defined as Class A high schools, $2.00; schools having not more than two teachers, $1.00. A membership fee once paid shall not be returnable. (When sending the fee, state the school, the principal, the postoffice, county, and district. Remittance of the fee may be by check, P. O. order, or currency. *Please do not send stamps.*)

SEC. 3. The membership fee must be paid by every school in order to entitle it to enter the county, district, or final contests in debate, declamation, essay writing, spelling, or athletics. The single payment of a membership fee, however, shall entitle all the pupils of any school to enter any one or all of said contests, including those of the county, district, and state. This membership fee shall be the only charge for admission to the contests except such entry fees as may be required in the athletic events.

SEC. 4. In a city system of schools, each high school, each junior high school, and each ward or elementary school where the latter is under a separate principal, is in a separate building from the high school and comprises the first seven grades or any subdivision thereof, shall constitute a separate member of the League and shall pay a separate membership fee. No pupil in one such school unit shall represent another in any contest, but the eligibility rule governing attendance shall not require attendance at one such school unit longer than one day, provided such pupil has been regularly transferred to that unit and has attended the city schools for the time specified in Eligibility Rule No. 6 of this constitution.

SEC. 5. Each school joining this League shall be entitled to a copy of the Constitution and Rules, six copies each of the word-lists for spelling, and, upon request, a copy of the bulletin containing programs for schoolhouse meetings, two copies of the bulletin containing material on the question for debate, together with such other bulletins and pamphlets as may be issued for the work of the League.

SEC. 6. Any school that enters any of the contests of this League without having paid its membership fee shall be disqualified for further contests for that year, unless a satisfactory excuse for such failure is presented to the State Executive Committee. The State Executive Committee shall certify to each

county director the schools in each county that have qualified for membership, and likewise on demand said committee shall certify to a district director the League members in his district.

ARTICLE IV.

Officers.

SECTION 1. The officers of this League shall consist of a State Executive Committee, and an executive committee for each district and for each county (cities having a population of 25,000 being considered counties).

SEC. 2. The State Executive Committee shall consist of the Director of the University Department of Extension as Chairman, two other members of the Extension staff, appointed by the chairman, and the University Directors of Physical Training. It shall be the duty of this Executive Committee to have administrative charge of the affairs of the League, to prepare and distribute bulletins and other literature pertaining to its work, to co-operate with county and district officers, and to decide disputes that may arise in county, district, and final contests, except in regard to the selection and decisions of judges.

(Note.—The members of the State Executive Committee are: E. D. Shurter (chairman), R. G. Bressler, R. L. Skiles, L. Theo. Bellmont, and Miss Eunice Aden.)

SEC. 3. Each district of this organization as hereinafter designated shall be under the general charge of a District Executive Committee to be appointed by the State Executive Committee and consisting of a Director General as Chairman, a Director of Debate and Declamation, and a Director of Athletics. It shall be the duty of such district committee to have immediate charge of the district contests in a given district; to organize and promote county contests; and to arrange for a final district contest not later than April 20. The Director General shall have general charge of arrangements for the district contests and immediate charge of the spelling and essay-writing contests. The Director of Debate and Declamation and the Director of Athletics shall have immediate charge of arranging for and conducting the respective contests denoted by their titles.

SEC. 4. The contests in each county shall be under the immediate charge of a County Executive Committee to be elected annually during the county teachers' institute, or in the event of failure so to elect, the County Executive Committee shall be appointed by the State Executive Committee. Such County Executive Committee shall consist of a Director General as chairman, a Director of Debate and Declamation, the County Superintendent of Schools as Director of Spelling, a Director of Essay-Writing, and a Director of Athletics. It shall be the duty of such county executive committee to have immediate charge of county contests in debate, declamation, spelling, essay writing, and athletics; to canvass schools for entries to such contests; to see that membership fees are paid before admission to such contests is allowed; to co-operate with the County Superintendent in effecting and promoting a county organization; to see that the University Interscholastic League is listed on the institute program and that a period is set aside for discussion of the work and the election of officers; to correspond with the State Chairman with regard to the interests of the work in the counties; to co-operate with adjoining counties in arranging a series of county contests that will permit representatives from the University to visit such contests; and in general to work toward making the county contests worth while in and by themselves, regardless of the district and final contests.

Unless the county institute otherwise provides, the County Superintendent of schools shall serve as County Director of Spelling. The Director General in each county shall have general charge of arranging for the county contests and shall have immediate charge of such industrial or other contests as may be arranged for the county meeting. The other county officers shall have immediate charge of arranging for and conducting the contests respectively denoted by their titles.

ARTICLE V.

Districts and District Directors.

For the purpose of district contests among the winners, the State shall be divided into 32 districts, designated by the fol-

lowing cities as centers, and comprising the counties named in alphabetical order under the respective district centers. The district officers are also named in each case, the Director General having immediate charge of the essay and spelling contests. In those cases wherein cities are named as separate districts, the city superintendents will in each case appoint the district officers. (See Article VI, Section 5, for further details regarding city contests.)

1. **Canyon.** Professor J. A. Hill, Canyon, Director General; Miss Mary Morgan Brown, Canyon, Director of Debate and Declamation; Professor D. A. Shirley, Canyon, Director of Athletics. *Counties:* Armstrong, Briscoe, Carson, Castro, Childress, Collingsworth, Dallam, Deaf Smith, Gray, Hall, Hansford, Hartley, Hemphill, Hutchinson, Lipscomb, Moore, Ochiltree, Oldham, Parmer, Potter, Randall, Roberts, Sherman, Swisher, Wheeler.

2. **Lubbock.** Professor M. M. Dupre, Lubbock, Director General; Professor F. E. Savage, Floydada, Director of Debate and Declamation; Professor W. T. Bowers, Post City, Director of Athletics. *Counties:* Bailey, Borden, Cochran, Crosby, Dawson, Dickens, Floyd, Garza, Hale, Hockley, Lamb, Lubbock, Lynn, Motley, Terry, Yoakum.

3. **Henrietta.** Superintendent C. F. Walker, Henrietta, Director General; Superintendent T. P. Walker, Bowie, Director of Debate and Declamation; R. P. Neville, Henrietta, Director of Athletics. *Counties:* Archer, Baylor, Clay, Cottle, Foard, Hardeman, King, Knox, Montague, Wichita, Wilbarger.

4. **Bonham.** Superintendent H. D. Fillers, Bonham, Director General; Principal E. C. McDonald, Gainesville, Director of Debate and Declamation; Professor Albert McDonald, Sherman, Director of Athletics. *Counties:* Cooke, Fannin, Grayson, Lamar.

5. **Texarkana.** Superintendent Geo. S. Carpenter, Texarkana, Director General; Superintendent A. V. Peterson, Mount Pleasant, Director of Debate and Declamation; Professor Joe E. Moose, Texarkana, Director of Athletics. *Counties:* Bowie, Franklin, Morris, Red River, Titus.

6. **Abilene.** Superintendent R. D. Green, Abilene, Di-

rector General; Superintendent J. H. Bright, Sweetwater, Director of Debate and Declamation; Professor H. F. Saunders Stamford, Director of Athletics. *Counties:* Callahan, Eastland, Fisher, Haskell, Jones, Kent, Mitchell, Nolan, Scurry Shackelford, Stonewall, Taylor.

7. **Mineral Wells.** Superintendent E. O. McNew, Mineral Wells, Director General; Principal W. O. DeWees, Weatherford, Director of Debate and Declamation; Principal B. M. Dinsmore, Mineral Wells, Director of Athletics. *Counties:* Denton, Hood, Jack, Palo Pinto, Parker, Stephens, Tarrant, Throckmorten, Wise, Young.

8. **Dallas-Fort Worth.** (Officers for each city to be named by the respective city superintendents. See Article VI, Section 5.)

9. **Greenville.** Superintendent L. C. Gee, Greenville, Director General; Superintendent A. M. Blackman, Plano, Director of Debate and Declamation; Clyde Littlefield, Greenville, Director of Athletics. *Counties:* Collin, Dallas, Delta, Hopkins, Hunt, Kaufman, Rains, Rockwall, Van Zandt, Wood.

10. **Marshall.** Principal A. J. Robinson, Marshall, Director General; Principal L. W. Morton, Longview, Director of Debate and Declamation; Superintendent M. G. Bates, Linden, Director of Athletics. *Counties:* Camp, Cass, Gregg, Harrison, Marion, Upshur.

11. **Midland.** Superintendent W. W. Lackey, Midland, Director General; Superintendent M. H. Brasher, Big Spring, Director of Debate and Declamation; Principal T. E. Hayden, Pecos, Director of Athletics. *Counties:* Andrews, Crane, Culberson, Ector, Gaines, Glasscock, Howard, Loving, Midland Reeves, Ward, Winkler.

12. **San Angelo.** Superintendent Felix Smith, San Angelo, Director General; Superintendent W. S. Fleming, Ballinger, Director of Debate and Declamation; Superintendent R. A Collins, Sterling City, Director of Athletics. *Counties:* Coke, Concho, Crockett, Irion, Reagan, Runnels, Schleicher, Sterling, Sutton, Tom Green, Upton.

13. **Brownwood.** Superintendent V. T. Griffin, Brownwood, Director General; Superintendent W. J. Gayden, Santa

Anna, Director of Debate and Declamation; Superintendent R. F. Holloway, Comanche, Director of Athletics. *Counties:* Brown, Coleman, Comanche, Coryell, Erath, Hamilton, Kimble Lampasas, McCulloch, Mason, Menard, Mills, San Saba.

14. **Hillsboro.** Superintendent W. T. Lofland, Hillsboro, Director General; Superintendent H. P. Walker, McGregor, Director of Debate and Declamation: Professor C. A. Cushman, Cleburne, Director of Athletics. *Counties:* Bosque, Falls, Hill, Johnson, McLennan, Somervell.

15. **Corsicana.** Principal G. O. Clough, Corsicana, Director General; Superintendent W. T. Adams, Mexia, Director of Debate and Declamation; Professor A. A. Scott, Waxahachie, Director of Athletics. *Counties:* Ellis, Freestone, Limestone. Navarro.

16. **Jacksonville.** Superintendent W. F. Garner, Jacksonville, Director General; Principal H. W. Stillwell, Tyler, Director of Debate and Declamation; Superintendent H. H. Pharr, Rusk, Director of Athletics. *Counties:* Anderson, Cherokee, Henderson, Houston, Leon, Smith.

17. **Timpson.** Superintendent Grover Hartt, Timpson, Director General; Superintendent A. J. Holmes, San Augustine, Director of Debate and Declamation; Principal Earl Huffor, Nacogdoches, Director of Athletics. *Counties:* Angelina, Nacogdoches, Panola, Rusk, Sabine, San Augustine, Shelby.

18. **El Paso.** (Officers to be named by the city superintendent. See Article VI, Section 5.)

19. **Alpine.** Superintendent E. R. Bentley, Alpine, Director General; Miss Una Jackson, Alpine, Director of Debate and Declamation; Superintendent J. E. Connor, Sanderson. Director of Athletics. *Counties:* Brewster, El Paso, Jeff Davis, Pecos, Presidio, Terrell.

20. **Austin-Waco.** (Officers for each city to be named by the respective city superintendents. See Article VI, Section 5.)

21. **Georgetown.** Principal C. Stuart Simons, Georgetown, Director General; Superintendent L. H. Hubbard, Belton Director of Debate and Declamation; Prof. L. F. McKay, Tem-

ple, Director of Athletics. *Counties:* Bastrop, Bell, Burnet Lee, Llano, Milam, Travis, Williamson.

22. **Navasota.** Superintendent J. Thomas Davis, Navasota, Director General; Superintendent C. N. Shaver, Bellville, Director of Debate and Declamation; Professor F. P. Hall, Navasota, Director of Athletics. *Counties:* Austin, Brazos Burleson, Grimes, Harris, Madison, Montgomery, Polk, Robertson, San Jacinto, Trinity, Walker, Waller, Washington.

23. **Kirbyville.** Superintendent W. D. Martin, Kirbyville, Director General; Superintendent A. J. Rushing, Jasper, Director of Debate and Declamation; Superintendent W. D Bracken, Jasper, Director of Athletics. *Counties:* Chambers, Hardin, Jasper, Jefferson, Liberty, Newton, Orange, Tyler.

24. **San Marcos.** Superintendent E. M. Day, San Marcos, Director General; Superintendent S. M. Eaton, Kyle, Director of Debate and Declamation; Professor F. G. Erney, San Marcos, Director of Athletics. *Counties:* Blanco, Caldwell Comal, Gillespie, Guadalupe, Hays, Kendall, Kerr.

25. **Uvalde.** Superintendent A. W. Evans, Uvalde, Director General; Superintendent J. W. Peeler, Hondo, Director of Debate and Declamation; Superintendent Carroll Thompson Cotulla, Director of Athletics. *Counties:* Bandera, Edwards Dimmit, Frio, Kinney, LaSalle, Maverick, Medina, Real, Val Verde, Uvalde, Zavala.

26. **San Antonio-Houston.** (Officers for each city to be named by the respective city superintendents. See Article VI, Section 5.)

27. **Floresville.** Superintendent W. B. Toone, Floresville, Director General; Superintendent Joe F. Wilson, Director of Debate and Declamation; Principal H. F. Alves, San Antonio, Director of Athletics. *Counties:* Atascosa, Bexar, Karnes, McMullin, Wilson.

28. **Cuero.** Superintendent A. S. Bush, Cuero, Director General; W. E. Patty, Gonzales, Director of Debate and Declamation; E. E. Bagwell, Flatonia, Director of Athletics. *Counties:* Colorado, DeWitt, Fayette, Goliad, Gonzales, Lavaca, Victoria.

29. **Bay City.** Superintendent W. H. Butler, Bay City,

Director General: Superintendent R. R. Foster, Angleton, Director of Debate and Declamation; Superintendent Asa W. Griggs El Campo, Director of Athletics. *Counties:* Brazoria, Calhoun Fort Bend, Galveston, Jackson, Matagorda, Wharton.

30. **Galveston-Beaumont.** (Officers for each city to be named by the respective city superintendents. See Article VI, Section 5.)

31. **Corpus Christi.** Principal R. D. Coley, Corpus Christi, Director General; Superintendent J. G. Toland, Alice, Director of Debate and Declamation; Superintendent Alvin Dille, Bishop, Director of Athletics. *Counties:* Bee, Brooks, Dunn, Duval, Jim Hogg, Jim Wells, Kleberg, Nueces, Live Oak, Refugio, San Patricio, Webb, Zapata.

32. **Harlingen. Superintendent** W. F. Jourdan, Harlingen, Director General; Superintendent Nannie Mer Buck Mercedes, Director of Debate and Declamation; Superintendent E. W. Nance, Mission, Director of Athletics. *Counties:* Cameron, Hidalgo, Starr, Willacy.

ARTICLE VI.

Contests.

Section 1. This League shall hold, annually, the following contests:

(a) *City Contests* as provided in Section 5 of this Article.

(b) *County Contests in:* Debate for boys, tennis doubles for boys, junior and senior spelling for boys and girls, junior and senior declamation for boys, junior and senior declamation for girls, declamation for rural school girls and boys, essay writing, girls' and boys' basket ball, and track and field events for boys. *Optional:* Industrial contests, baseball, and track and field events for girls.

(c) *District Contests in:* Debate for boys, tennis doubles for boys, spelling, junior and senior declamation for boys and girls, declamation for rural school girls and boys, essay-writing and boys' track and field events.

(d) *State Contests in:* Debate for boys, tennis doubles for

boys, junior, senior and rural school declamation for boys and girls, spelling, essay-writing, and boys' track and field events.

SEC. 2. *Time of Holding the Contests.*—Final county contests shall be held between March 1 and April 6, district contests between April 8 and 20, and the final State contest on the first Friday and Saturday in May. (For 1918 this will place the final contests on May 3 and 4.)

SEC. 3. *Sub-county Contests.*—In counties where the League memberships are expected to be large it is a good plan to provide for sub-county contests. Such contests, however, are for the purpose of practice, arousing local interest and to furnish a means of developing community spirit, and not for the purpose of eliminating contestants for the county finals, except, perhaps in basket ball. The County Executive Committee should divide the county into districts (four or six will be found a convenient number), fix the time and place for the sub-county contests, and appoint a Director for each. All such matters and any special rules that may be made for sub-county contests shall be announced to all the schools in the county at least one month before the time set for holding such contests. As to basket ball, if the county is divided into at least four districts, then the committee may arrange to eliminate in basket ball all but the two highest ranking teams in each division for the final county meeting.

SEC. 4. *County Contests.*—The County Executive Committee shall fix the time (see Section 2 above) and place of the county contests and announce the same to all the schools in the county at least one month before the time specified for holding the same. (It is well for the county teachers' institute to elect the County Committee several days before the institute adjourns so that the Committee can organize and decide upon plans for the county contests for announcement during the session of the institute.)

SEC. 5. *City Contests.*—The cities named as districts in Article V are ineligible to county contests, but may send representatives direct to the State meet upon the following conditions: At least three-fourths of the white schools in such cities must join the League and participate in one or more of the various events in the city elimination contests. (*Note.*—The principle

underlying the foregoing rule is that when a city, either by itself or in conjunction with another city, is made a League district, the schools as a whole should contribute toward the support of the League by payment of the required membership fee; and that to allow district representation to only a few competing schools in a city would be unfair to the other districts.) When two cities together are named as a district, city elimination contests shall be held prior to April 20, the final date for the district contest, each city for this purpose being analogous to a county. Unless otherwise arranged by the respective city officers, the joint contest for district representation to the State meet shall be held at the first-named city (as per Article V) in odd-numbered years, and at the second-named city in even-numbered years. The officers of the city where the district contest is held shall have general charge of arrangements for the contests, the judges selected being subject to the approval of the officers of the visiting city.

SEC. 6. *District Contests.*—It shall be the duty of the District Executive Committee to announce the time and place of the district contests at least one month before the time set for holding the same and to communicate with and assist county officers of the League in regard to matters pertaining to the county and district contests. Only the winners in the different events in the county contests shall be eligible to participate in the district contests in debate, declamation, tennis, spelling, essay writing, and athletics, except the winners in these events in each city of 25,000 inhabitants by the last United States Census may enter the district contests under the conditions specified in the preceding section.

ARTICLE VII.

Who May Enter the Different Contests.

SECTION 1. *The Junior Division.*—The Junior division is open only to boys and girls under 15. Furthermore, except in athletics, the Junior division is not open to any pupils who have been regularly promoted to the ninth grade in schools other

than rural schools, nor to any pupils in a high school where there are one or more complete ward or elementary schools under a separate principal and in a separate building from the high school. Boys and girls under 15 who, on account of the restrictions stated in the preceding sentence, are ineligible to the junior contests, may enter the senior contests.

SEC. 2. *The Senior Division.*—Any pupil may enter the Senior or Class A High School Division in Athletics, debate, declamation, spelling, or essay-writing, *except that a pupil eligible to the Junior declamation contest is not eligible to the Senior declamation* contest, and also excepting the cases mentioned in the two following sections.

SEC. 3. *The Rural School Division.*—A separate declamation contest is open only to rural schools having not more than two teachers and not located in an incorporated town. There shall be separate declamation contests for boys and for girls in this division, but no junior and senior subdivision. A rural school having a contestant in declamation for rural schools may also be represented in the other divisions in declamation (observing the rule as to age) either by the same or by another contestant.

SEC. 4. *State Winners Barred.*—The winner of the State championship (that is, first place) in debate, declamation, spelling, essay-writing, or tennis shall not be eligible to that event again.

SEC. 5. The same contestant shall not be eligible to represent his school in both debate and declamation in the same year. (*Note.*—There is no other absolute rule against double representation, but since elimination contests in debate, declamation tennis, and track are held concurrently at the State Meet, it is inadvisable for a contestant to attempt to enter for more than one of these contests.)

SEC. 6. *Class A and Class B Divisions.*—Excepting in tennis for atheltic purposes high schools shall be divided into two for athletic purposes high schools shall be divided into two divisions as follows: Class B, to include schools not in cities having a white scholastic population of 600 or over according to the last published census of the State Department of Education, and also Junior high schools, provided contestants from Junior

high schools must not be more than 18 years of age; and Class A, to include all other high schools. A Class A school may not enter a contestant in Class B division, but a Class B school may enter either Class B or Class A division, or both at the same time, provided, that the total number of events in both divisions which a contestant may enter shall be counted in determining whether such contestant has exceeded the maximum of five (5) track and field events which any contestant is permitted to enter.

SEC. 7. *Age Limit.*—The age limits as prescribed in this Article and elsewhere in this Constitution shall be determined by the age of a pupil on the first day of the preceding September. (If a student had reached his or her twenty-first birthday on the first of the preceding September, such student is ineligible to any contest. A boy or girl who has reached his or her fifteenth birthday by that date is ineligible to the junior contests.)

ARTICLE VIII.

Eligibility Rules for All Contests.

With the exception of Nos. 4, 7, and 8, which apply to athletic contests only, the following eligibility rules shall apply to every contest held under the auspices of this League, whether such contests be one in debate, declamation, spelling, essay-writing, or athletics. *School principals and superintendents should see that these rules are strictly observed in each and every contest in which their pupils engage.*

RULE 1. *Age Limit.*—No one shall take part in any contest in this League who, on the first day of the preceding September, has passed his or her twenty-first birthday.

RULE 2. *Undergraduates Only.*—No one shall take part in any contest in this League who has graduated from his school or other school of equal or higher rank, *except;* a contestant shall not be barred by this rule who graduated from a third class or second class high school, according to the classification of the State Department of Education, and returns the next year to take the advanced work in a high school of a higher class.

provided, that such pupil is an undergraduate in the school to which he or she has transferred.

RULE 3. *Scholarship Requirement.*—No one shall take part in any contest in this League who, at the time of the contest, is not taking at least four studies, each of which requires 180 minutes devoted to recitation each week, and who is not making a passing grade in at least three such studies. *Provided,* that a pupil in a grade below the high school shall be considered as fulfilling the scholarship requirement if he is taking a total of 720 minutes of recitation work each week and is passing in at least three-fourths of such work, and *provided further,* that in a school not offering a total of 720 minutes of recitation work per week a pupil may satisfy the scholarship requirement if he is taking the regular amount of recitation work for that school and is passing in three-fourths of such work.

[*Note.*—A contestant must pass in his work up to the time of the particular contest in each case. The last report of a pupil shall be taken as determining his eligibility under this rule, such "last report" being in accordance with the custom or regulation in a particular school.]

RULE 4. *College Contestants Barred.*—No one shall take part in any contest in this League who, either as a substitute or as a regular, ever represented a college in any contest.

RULE 5. *Day Students Only.*—The studies required to be taken according to Rule 3 above shall be taken during the day session of school.

RULE 6. *Attendance.*—No one shall take part in any contest in this League who, at the time of the contest, has not been a *bona fide* regular attendent at his or her school for thirty calendar days immediately preceding the contest.

[*Note.*—Absence for not over one week on account of sickness or other unavoidable cause shall not bar a pupil if a written certificate of such cause for absence is presented, signed by the parent or guardian.]

RULE 7. *Four-Year Rule.*—No one shall take part in any athletic contest in this League who has participated in either academy or high school athletics, or both, for four years.

RULE 8. *Amateurs Only.*—No one shall take part in any

athletic contest in this League who has ever competed for money or other valuable consideration. Traveling expenses and merchandise of only nominal value, however, may be offered in any contest of the League.

RULE 9. *Playing Under Assumed Name.*—No one shall participate under an assumed name in any contest of the League

RULE 10. *Contestants Below High School.*—A student in a grade below the high school may not represent the high school in athletics unless he or she is under eighteen years of age. In case a grammar school student plays on a high school team, the number of years such pupil plays as a grammar school pupil shall be taken as part of the maximum of four years in which a contestant may represent a high school.

RULE 11. *Certificate of Eligibility.*—Before each game or contest in this League, each school shall file with the director in charge and upon demand shall furnish to the manager of an opposing team a list of the contestants representing that school with the eligibility of such contestants certified to by the principal or superintendent.

RULE 12. *Suspension for Infraction.*—Any school that violates any of the eligibility rules of this League shall be suspended from further competition that year in the contest under consideration. Should the director consider the offense to be of such character as to merit further punishment, he shall lay the facts before the State Executive Committee, who shall assess such additional punishment as may seem just.

RULE 12. *May Not Play Suspended Teams.*—No school in this League shall allow its team to engage in a contest with the members or team of any school suspended for infraction of the eligibility rules of the League, and any school violating this rule shall be subjected to the same punishment as was assessed against the school with which it contested.

ARTICLE IX.

Relations Between County, District, and State Contests.

SECTION 1. The Junior Track and Field Meet, and the industrial contests shall be confined to the county. Contestants from

cities designated as districts in Article V are barred from county contests, but may enter the district contest direct, subject to the provisions of Article VI, Section 5.

SEC. 2. In the district contest, the following from each county shall be eligible to compete: The winning team in debate, the winning team in tennis doubles, the winners in Junior and Senior spelling (boys and girls), the first, second and third ranking contestants in essay-writing, the winners in Junior and Senior declamation for girls and also for boys, the girl and boy winners in rural school declamation, and each boy who won first or second place in any event in the senior track meet in the county contests.

[*Note.*—The district executive committee may arrange for additional contests—see Article VI, Section 1—but unless there is a general demand, it is better to confine the district meeting to those contests wherefrom the winners go on to the State Meeting.]

SEC. 3. In the final State contest, the following shall be eligible to compete: The winners in the district contests in debate for boys, tennis doubles for boys, junior, senior and rural school declamation for girls and boys, the winner of first place in spelling, the first, second and third ranking contestants in the essay contest, and track and field contestants as provided in the next section.

SEC. 4. *Track Representation to Final Meet.*—Any school in good standing in the League may enter a team of not more than eight men in the final track meet, but no more than five from one school and only those who qualify under the following rules shall receive any rebate of railroad fare:

(a) The winner of two first places in any of the prescribed events in a district meet shall receive full rebate. (See Article XII.)

(b) The winner of one first place in a district meet shall receive one-half rebate.

(c) The winner of one first place in any event in the State Meet at Austin shall receive full rebate.

(d) Should the maximum number of rebates as fixed by the State Executive Committee not be reached by the number of

applicants who have qualified under the conditions specified above, then each winner of two second places in the district meets shall be allowed rebate in the order of application, until the maximum is reached.

SEC. 5. Those entitled to rebate on railroad fare and to lodging during the State meeting at Austin are: The winning debating and tennis teams, the junior, senior and rural school declaimers, the winner of first place in spelling, each track contestant who qualifies under Section 5 of this article, and one faculty representative from each school having one or more contestants entitled to rebate.

SEC. 6. The State Executive Committee will undertake to provide lodging for all delegates and contestants at the final meeting of the League. In many cases board will also be furnished free by private parties, but the Committee has found it impracticable to assume responsibility for meals.

ARTICLE X.

Reports and Press Notices.

County and District Directors shall promptly report to the State Chairman, at Austin, the winners in the county and district contests, and shall also furnish reports of these contests to the local press; and the principals of the winning schools in the district contests shall promptly send to the Executive Committee photographs and brief sketches of the winning speakers and athletes, for use in the local and State press.

ARTICLE XI.

All-Round Championship.

SECTION 1. There shall be awarded to the public schools in the county and district meets, county and district all-round championships to the school, which shall score the highest total number of points under conditions specified below.

SEC. 2. The following events shall score the number of points indicated:

(1) Boys' and Girls' track events: five, three, two, and one point, respectively, for first, second, third and fourth place in each event.

(2) Girls' basket ball, in both divisions, boys' basket ball, and boys' tennis doubles: ten points for first place, five-points for second place.

(3) Debate: first place twenty points, second place ten points, and three points to each of the two teams losing in the semi-finals.

(4) Spelling, essay writing, and boys' and girls' Junior, Senior, and rural school declamation: first place ten points, second place five points, and third place two points.

SEC. 3. No school shall be eligible to the all-round championship that does not score in at least three different contests and in both athletics and spelling, or athletics and public speaking, or athletics and essay writing.

ARTICLE XII.

Expenses and Rebates.

SECTION 1. In the county and district contests, the prizes offered and the traveling expenses of contestants and of judges shall be provided for as the respective directors may determine. Admission charges to local, county, and district contests may be made when deemed advisable.

SEC. 2. At the final contests at the University the visiting contestants shall bear their own expenses in the first instance. The State Executive Committee, however, shall devote the amount received in membership and entry fees, after defraying necessary expenses, to the payment of rebates of railroad fares to Austin and return at the reduced rates offered each year. Such rebates shall be based on railroad fares only, and shall not include sleeper, meals, or other expenses. The rebates shall be payable to the principal of each school which is represented by actual participation in the preliminary and final contests in either debate, declamation, spelling or athletics, and including one teacher from each participating school. Not more than five track contestants from any one school, and only those who

qualify as provided in Section 5 of Article IX shall be entitled to rebate of railroad fares. The State Executive Committee may in its discretion limit, by due notice, the number of delegates from distant points that will be entitled to such rebates.

In order to equalize the burden of traveling expenses for the more distant schools, and conditioned upon available funds as estimated below, in case the one-way fare to Austin is not over $2.00, no rebate will be paid; if the one-way fare is over $2.00 but not over $5.00, delegates shall receive, say, 40 per cent rebate; if over $6.00 but not over $10.00, 50 per cent rebate; if over $10.00, 60 per cent rebate.

The foregoing are merely the proportional percentages. It is hoped that the receipts of membership fees will permit an increase in the percentage named in each case.

ARTICLE XIII.

Disputes.

All disputes among members of the League shall be settled by the appropriate executive committee. A county or district executive committee may, if desired, submit a case in dispute to the State Executive Committee for adjudication. Others who feel that they have a just cause for complaint against a county or district executive committee may appeal the case, *excepting the selection and decisions of officers or judges of contests,* to the State Executive Committee for final decision; in which instance a written statement of facts shall be presented both by the appellant and by the county or district executive committee.

ARTICLE XIV

Annual Meeting.

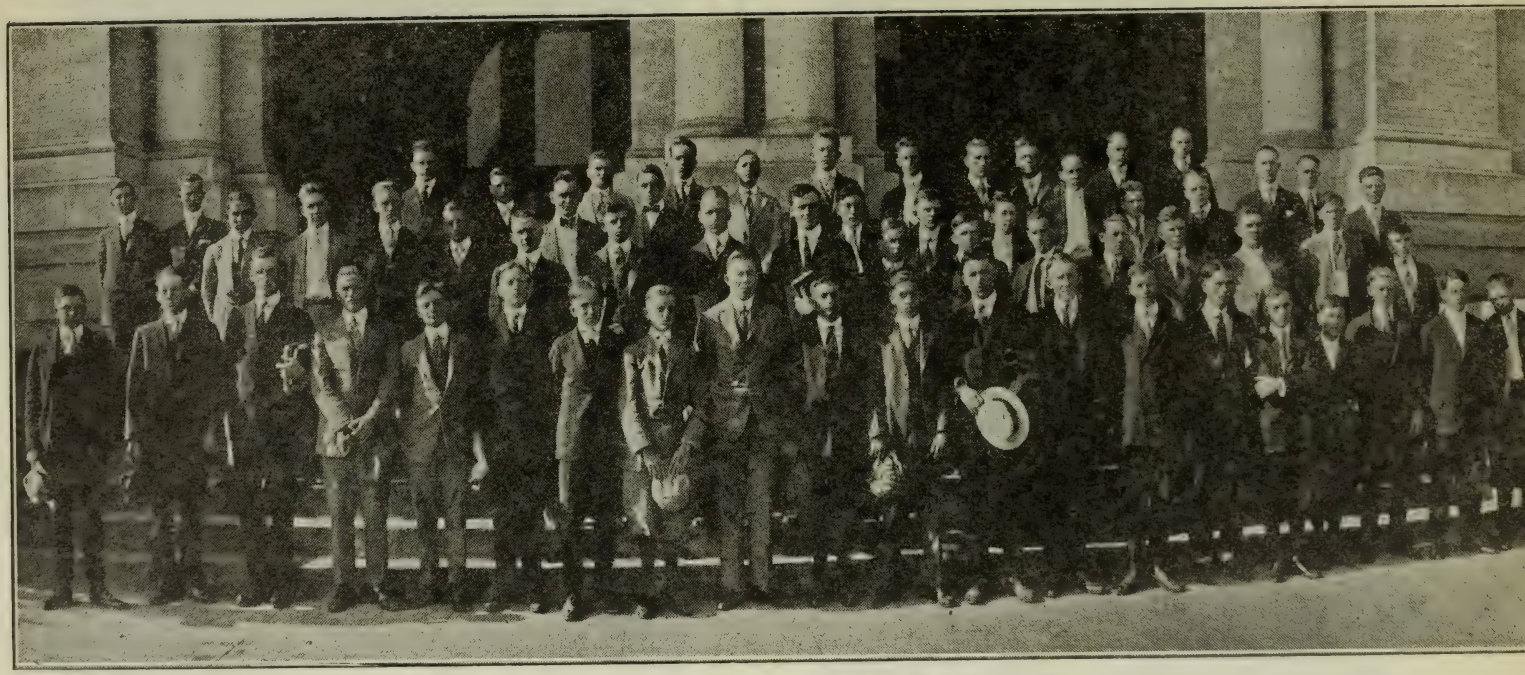
Section 1. The annual meeting of the League shall be held during the State Teachers' Association meeting. At the annual meeting, matters pertaining to the League shall be discussed, and recommendations made to the State Executive Committee regarding any changes in the rules for the next year's contests.

Each school belonging to the League shall be entitled to one vote at this meeting. A school having no representative present may vote by duly authorized proxy.

ARTICLE XV

Amendments.

All amendments to the constitution and rules of the League shall be made by the State Executive Committee, provided, that all material changes in the eligibility and other rules which do not involve a question of University policy shall first be submitted to the members of the league for an advisory vote.



DEBATING TEAMS AT THE STATE MEET, 1917

RULES IN DEBATE AND DECLAMATION

FOREWORD

Please bear in mind that the primary purpose of the contests in debating and declamation is, as the Constitution states, "to foster in the schools of Texas the study and practice of public speaking and debate as an aid in the preparation for citizenship." The League exists not for a few schools that may have exceptionally fine speakers, but rather to incite all the schools to develop in their pupils a talent for clear-cut, sincere, and effective speaking before an audience.

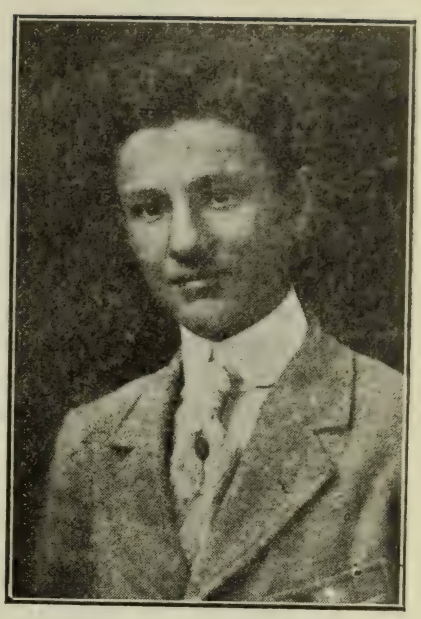
With the large membership which the League has now attained, the county contests must be more and more emphasized, since it is obvious that very few of the debaters and declaimers who should participate in the county contests can possibly go to the district and State contests. The principal who waits to enter his pupils for a contest until he can turn out a winning debating team will probably never develop a winning team. Moreover, this shows a wrong attitude towards the contests and encourages an unwholesome school spirit. Remember that the contests are only a means to an end, and hence the mere fact of winning should not be taken too seriously.

Especially in debate and declamation, wherein no absolute standards of judging are possible, teachers and students should guard against questioning the decisions of the judges. See that the rules of the contest are observed, and then leave the result absolutely to the judges. Squabbling over decisions is unsportsmanlike, and this practice has been altogether too common among even the teachers. It is fine training for a boy to learn how to lose as well as how to win.

RULES IN DEBATE

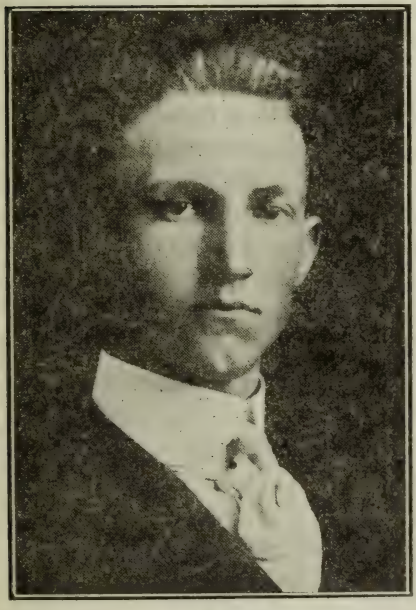
1. *Eligibility.*—The debating team representing each school shall consist of two members, both being male students in the same school. The debaters shall be subject to the eligibility rules contained in Article VIII of the Constitution of this

FRANK MORAN

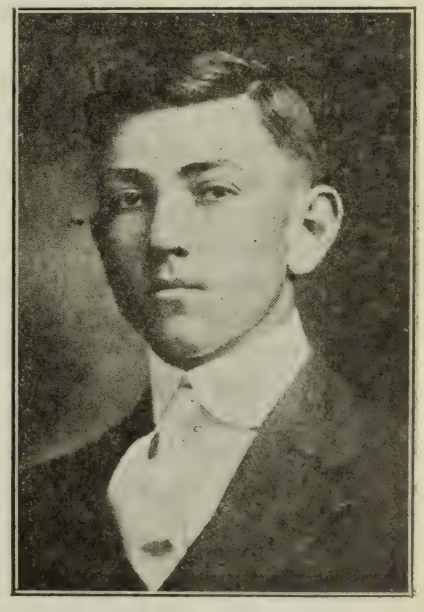


LOWELL BRAUN

Oak Cliff High School, State Winners in Debate, 1917



ELWYN HARDY



ORUS STEPHENS

Tioga High School, Second Honors in Debate, 1917

League. No student can represent his school in both debate and declamation. Former winners of first honors in the State contest are barred.

2. *Question for Debate.*—The question for debate at the final contest in 1918 is: *Resolved, That universal military training similar to the Swiss system should be adopted in the United States. Constitutionality granted.* Unless by consent of both teams concerned, the question in all preliminary debates shall be the one assigned for the final contest; and all debaters shall be prepared to speak on either side of this question. (For date limits of county and district contests, see Constitution, Article VI, Section 2.)

3. *Choice of Sides.*—In all contests sides shall be determined either by mutual consent or by lot. Whenever a series of preliminary contests are held, the winning teams in a given contest shall immediately choose sides for the next contest.

4. *Coaching for Debate.*—Aside from the bulletins and loan material furnished by the University, and other reading matter, the assistance furnished contestants in preparing debates shall not exceed the following: (a) aid in outlining the arguments; (b) citing sources of information; (c) correcting errors in English; and (d) suggestions as to delivery. Whenever a debater quotes at any length the words of another, that fact must be plainly stated. Proof that either member of a debating team has received assistance other than as above specified, or that quoted matter is used without giving due credit therefor, shall disqualify such team in all League contests for that year.

5. *Coaching During a Debate.*—In all contests the debaters shall be separated from the audience and shall receive no coaching while the debate is in progress. By "coaching" is meant *viva voce* or other prompting either by the speaker's colleague or by any other person. A debater may, however, refer to his notes or manuscript when desired.

6. *Exclusion of Interested Schools.*—It shall be considered dishonorable for the pupils or teachers of one school to visit the debates of another when the two schools are likely to meet on the same question. It shall be the duty of the presiding officer to enforce this rule, and in case of its wilful violation, such school shall be debarred from further contests for that year.

7. *No Interruption of Speakers.*—A speaker shall not be interrupted in any manner while he is speaking, either by cheers or otherwise, and the presiding officer shall see that this rule is strictly enforced. However, sincere and courteous cheering at the close of a speech is allowable and desirable.

8. *The time and order of speeches* shall be as follows:

MAIN

Affirmative, 10 minutes.
Negative, 10 minutes.
Affirmative, 10 minutes.
Negative, 10 minutes.

REBUTTAL

Affirmative, 4 minutes.
Negative, 5 minutes.
Affirmative, 4 minutes.
Negative, 5 minutes.
Affirmative rejoinder, 3 minutes.

Either side, if it so desires, may reverse the order of its speakers in rebuttal from that of the main speeches; and either one of the affirmative speakers may take the closing rejoinder.

9. *Judges.*—The judges for the debating and declamation contests shall be three, five, or seven in number, selected on the basis of capability and impartiality. (Note.—Whenever practicable, at least five judges should be appointed.) The judges for the county and district contests shall be chosen by the appropriate executive committee, subject to the approval of a majority of the school principals concerned, or their representatives. For the final contests at the University the judges shall be chosen by the State Executive Committee. Judges in debate and declamation shall sit apart during a contest, in order to hear the speakers from different parts of the auditorium. (Note.—The Director of Debate and Declamation should not fail to submit in advance to interested schools the names of proposed judges and to secure the approval of at least a majority of such schools.

Especial care, too, should be used in selecting judges in debate. A person may be a good judge of many things, but not of a debate. Lawyers, as a class, by reason of their profession, are good judges of debating.)

10. *Schools represented not to be known by the Judges.*—So far as possible, the judges shall not know the school a debating team represents, the contestants being designated as being on the "affirmative" or "negative" side. But this rule does not apply to the final contest at the University.

11. *Instruction to Judges.*—A copy of the following instructions shall be given to each judge: "The judges, who shall sit apart during the debate, shall judge the contest as a debate, voting without consultation 'Affirmative' or 'Negative' on the merits of the debate, irrespective of their individual opinions as to the merits of the question. In deciding which team has done the more effective debating, the judges shall take into consideration argument and delivery in both main and rebuttal speeches. In cases of doubt (that is, where the two teams are about equally balanced) argument shall be stressed relatively more than delivery and rebuttal work more than the main speeches. At the close of the debate each judge shall indicate his choice by ballot and deliver it to the presiding officer, who shall inspect the ballots in the presence of a representative of each school and announce the decision."

12. *Final Contest.*—The winning team in each district contest shall meet at the University on the first Friday in May, when preliminary debates shall be held until two teams shall have been chosen for the final contest.

(*Note.*—Debating squads of University students can usually be sent to debate the League question, when desired, provided a given school or community can arrange to pay the traveling expenses of the two speakers composing each squad.)

RULES IN DECLAMATION

1. *Eligibility.*—There shall be six contests in declamation: a Senior, a Junior, and a rural school contest, for both boys and girls. (For eligibility rules generally, see Constitution, VII and VIII.) No student can represent his school both in

SENIOR GIRL DECLAIMERS AT THE STATE MEET, 1917
Winner: Edith Schneider San Antonio; Second Honor: Jane Jackson, Mexia.

STATE CONTESTANTS IN BOYS' SENIOR DECLAMATION, 1917

Winner: Henry Herndon, San Antonio; Second Honor: Edwin McMath, Plainview

STATE CONTESTANTS IN JUNIOR BOYS' DECLAMATION, 1917
Winner: Alton Thomason, Nacogdoches; Second Honor: Leon Kotosky, El Paso

debate and in declamation, and former winners of first honors in a State contest are barred. A school having a declaimer in the rural school division may also be represented in the other declamation contests (observing the rule as to age-limits) either by the same or another contestant.

2. *Nature of Declamation.*—In the girls' Junior division, selections from standard poems shall be used, excluding dialect and impersonation. So far as applicable, the character of the selections for the girls' Junior contest shall be the same as specified below for the contests in the other divisions.

In the boys' Junior division, in the boys' and girls' Senior divisions and in the Rural School division each declamation shall consist of a prose selection from some standard author or well-known speaker. The subject-matter of each selection shall be prevailingly serious in tone, and delivered for the purpose of convincing or persuading the audience of certain ideas or truths; in other words, a declamation should not be chosen which is primarily adapted to the purposes of mere entertainment. Poetry (excepting such poetical quotations as may be included in prose selections), "funny" pieces, dramatic readings, and impersonations will not be allowed. Each student shall select a declamation the words of which he adopts as his own for the purpose of speaking to a present-day audience on a subject of present-day interest and importance. In case of doubt as to the interpretation of this rule, the State Executive Committee should be consulted, and the decision of such committee shall be final. No declamation in the county, district, or final state contest shall exceed five (5) minutes in length (about 600 words, or two pages of a book of ordinary size).

[*Note.*—A five-minute selection having required unity and sequence can readily be secured by judicious cutting—supplying, it may be, a connecting sentence or phrase here and there. Very often a three-minute selection is a complete unit, and in such case, that is long enough. No special subject for declamations is now required. In advance response to numerous inquiries, a collection of declamations suitable for all the divisions, entitled "Winning Declamations," may be obtained of the Texas Publishing Co., Austin or Dallas, for $1.10.]

3. *Programs of County and District Contests.*—The order of speaking in the county and district contests shall be determined by lot. In the county contests each school and in the district contests each county (also cities as per Article VII, Section 5) shall regularly be represented by one speaker in each contest; that is, a boy and a girl for each of the three divisions. The winner in each division—senior girl, senior boy, junior girl, junior boy, and the respective girl and boy winners in the rural school division—go on to the district and State contests.

4. *Programs of Final Contests.*—Elimination contests among the thirty-two district winners in each class shall be held at the University on the first Friday in May. The number in each division shall be reduced to either three or six (to be determined by the State Executive Committee), the survivors to compete in the final contest at times and places to be announced prior to the State meet. The order of speaking in the elimination and final contests at the University shall be identical with the numbered order of the districts, beginning with District No. 2 (Lubbock) in 1918, and moving up one number each successive year.

5. *No Interruption of Speakers.*—A speaker shall not be interrupted in any manner while he or she is speaking, either by cheers or otherwise, and the presiding officer shall see that this rule is strictly enforced. Sincere and civilized cheering between speeches, however, is allowable and desirable.

6. *Coaching.*—No speaker shall be coached or prompted in any manner during the delivery of the declamation.

7. *Timekeepers.*—At each contest there shall be a timekeeper, who shall notify the speaker and the presiding officer, by ringing a bell, or other signal, whether the speaker has consumed the time-limit of 5 minutes, in which case the speaker shall be required to conclude in one-half minute.

8. *Judges.*—The judges in declamation shall be selected as prescribed for the Rules in Debate.

9. *Instruction to Judges.*—The judges in the declamation contests shall receive the following instructions: "This is a contest in delivery only, the speeches not being original productions. The basis of judging each contestant shall be: general effectiveness as a speaker. In cases of doubt, naturalness,

earnestness and force shall count relatively more than polish and gracefulness. Contestants in the junior girls' division are to deliver selections from standard poetry, excluding dialect. impersonation, and selections that may be classified in their effect upon the audience as dramatic readings. In other divisions in declamation prose selections are required. The declamations are to be prevailingly serious in tone and delivered for the purpose of informing, convincing, or persuading the audience of certain ideas or truths; in other words, a declamation shall not be primarily for the purpose of mere entertainment. All purely 'funny' pieces (although humor is not excluded, so that it has some point), dramatic readings, and impersonations are barred. The purpose of these declamation contests is to develop a type of speaking that will aid in training pupils for citizenship. Whenever declamations are delivered that do not conform to the requirements named, the judges shall disregard such a declamation in the grading."

At the close of the contest each judge shall rank the speakers by the numbers one, two, three, etc. A speaker ranked first by a majority of the judges shall be awarded first place. In case no speaker is ranked first by a majority of the judges, the contestant the sum of whose ranks is least shall be awarded first place. The speakers receiving second and third places, respectively, shall be determined in the same manner. The ranks of the contestants shall be computed either by the judges themselves or by a committee appointed for that purpose. In case of a tie in ranking, the judges shall confer and decide the ranking of those tied. So far as possible, judges shall not know what school a contestant represents (except in the final State contest), and the grades of an individual judge shall not be divulged by his signing the grade-sheet, or otherwse. As a result of the contest, the presiding officer, or some one selected by him shall announce the names of the speakers awarded first second, and third places, respectively, and also the school each represents.

[*Note.*—This rule requiring a separate vote by judges, without conferring, is new, but is easy in operation if carefully followed. Grading blanks will be furnished by the State Chairman, upon application.]

RULES IN ESSAY-WRITING

1. *Eligibility.*—The contest shall be open to any student either boy or girl, in a school that is a member of the University Interscholastic League, provided a contestant can qualify under the eligibility rules as contained in the Constitution and Rules of the League.

2. *Nature of the Composition.*—The essay must be in the nature of a humorous short story, not over 1,000 words in length, and the subject, or plot, must be based on a personal experience or observation of the writer. Such titles as, "The Most Embarrassing Moment of My Life," "The Worst Scare I Ever Had," "A Laughable Incident in the Life of ———," are suggested subjects, but the story may be on any of many other topics that come within the range of the author's personal observation or experience.

3. *Detailed Requirements.*—The essay must be written in ink, or typewritten, on one side of paper 8½x11 inches, *signed by a fictitious name*, and accompanied by a sealed envelope with the fictitious name written on the outside, the envelope enclosing a statement of the author's real name, postoffice address, and the certificate by the principal of the school as specified in Rule 4.

4. *Certification of Original Work.*—The principal of the school must certify that the essay is the work of the individual student in each case, and that such student is eligible to the contest pursuant to the provisions of Rule 1.

5. *County Contest.*—Each school belonging to the League may submit not more than three essays in this contest. The papers submitted shall first be sent to the County Director of Essay Writing not later than March 1. The County Director shall select a committee of three properly qualified and impartial judges, exclusive of teachers whose schools are represented in the contest, to grade the essays as to relative excellence in organization, interest, and composition. The elements of plot and interest shall be stressed, in judging, relatively more than composition. The judges shall denote the first, second, and third best essays among those submitted. The County Director of

Essay-Writing shall then open the envelopes accompanying the three best essays as denoted by the judges, and, after noting the authors in each case for announcement at the County meeting of the League, shall enclose the statements referred to in Rule 3 in another sealed envelope, writing threon the author's fictitious name. The three winning essays, with accompanying envelopes, shall be forwarded not later than March 15 to the Director General of the district in which the county is situated.

[*Note.*—It is suggested that members of the faculty of neighboring colleges or normal schools can often be secured to read and grade these essays.)

6. *District Contest.*—The essays selected as a result of the county contest within a given district shall be judged by a committee of three to be selected by the District Director General, exclusive of teachers whose schools are represented in the contest. The rules and directions for the county contest (Rule 5) shall also apply to the district contest. The three winning essays in the district contest shall be forwarded not later than April 10 to E. D. Shurter, University, Austin.

7. *Final Contest.*—The essays submitted as provided in the preceding section shall be judged by a committee of three to be selected by the President of the University, and the authors of essays that are first, second, and third highest in rank shall be respectively awarded gold, silver, and bronze medals. To the school whose pupil wins first place shall be awarded (for one year) the University cup for essay writing, and the author shall receive a set of Mark Twain's works, offered by Dr. H. T. Musselman, editor of the *Texas School Journal.*

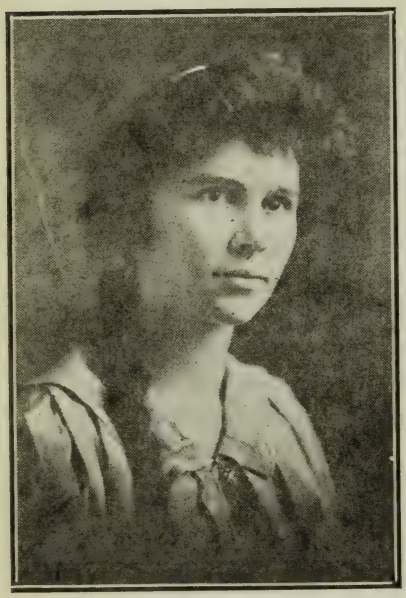
8. *Publications.*—The names of the winners shall be announced at the annual State Meeting of the Interscholastic League, and the State Executive Committee reserves the option of publishing any of the essays in the *Texas School Journal.*

RULES IN SPELLING.

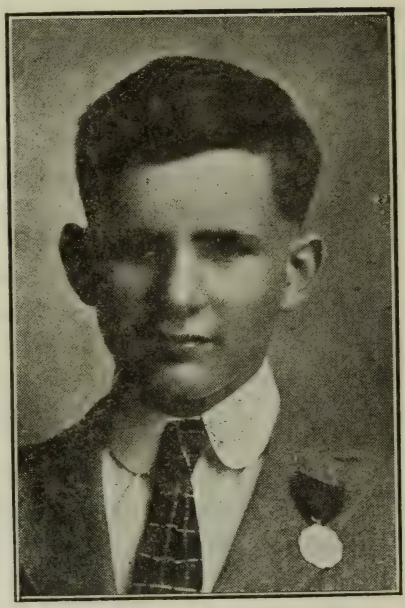
1. *Eligibility.*—Each school in the League may enter two contestants (boys or girls) for the final county contests in spelling, provided such contestants are eligible under the rules in Article VIII of this Constitution.

2. *Classification.*—In the county contest there shall be a Junior and a Senior division. (See "Definitions," page —.) Each school shall send at least one representative in the Junior division and the two spellers from each school may both be in the Junior class, provided they outspell the Seniors in the local contest. (See bulletin containing programs of schoolhouse meetings.)

3. *Sources.*—The words for the spelling contests shall first be taken from a list to be furnished by the State Chairman classified into a Junior and a Senior list. Each school joining the League will be entitled to six copies of these lists (extra copies two cents each), and these lists should be used for regular spelling lessons in the school. The person pronouncing the words shall first exhaust the prescribed tryout list for each division. Words shall then be selected from the State Adopted Speller or from such other sources as the Director of Spelling may designate. Every effort practicable shall be made to spell the contestants down within one hour. In the county contest the last three to spell down in each division shall be declared winners of first, second, and third places, respectively. The three highest in the Senior division and the Juniors winning second and third places shall then engage in a final contest for the district meeting. To these five contestants selected words from the State Adopted Speller shall first be pronounced for not longer than half an hour. Words from other sources may then be given, if necessary. Each county shall be entitled to two spellers at the district meeting, one of whom shall be the winner in the Junior division. The other county representative shall be determined from the result of the final contest last mentioned; that is, each county shall be represented by at least one speller in the Junior division, and the other representative may be either a Junior or a Senior, depending upon the result of the final tryout.



MINNIE LEE CARPENTER
San Benito High School
Winner in Spelling Contest, 1917



J. C. WHITE
Belton High School
Second Honor in Spelling, 1917

4. *District Contest.*—In the district contest all contestants shall be placed in the same division, and the pupil winning first place (only), whether a Junior or a Senior, shall be entitled to come to the final State contest at the University. In the district contest words shall first be pronounced indiscriminately for not more than half an hour from the tryout list referred to in Section 3. Thereafter words shall be selected from such sources as the person pronouncing shall choose.

5. *State Contest.*—In the final State contest the words pronounced shall be as specified in the preceding section for the district contests.

6. *Methods of Conducting the Contests.*—In all the contests in spelling,—local, county, district, and State,—the contestants shall spell orally the words given to them in succession. The Director of Spelling or some one designated by him shall pronounce each word distinctly. The pronunciation of a word may be repeated if a given contestant does not understand it. There

is no objection to giving a sentence containing the word if thought advisable to make it clear. When in doubt of the pronunciation or spelling of a given word, Webster's Dictionary either the Secondary School edition, or the Collegiate, or the New International, shall be the final authority. When a contestant, having had one try at a word, misses it, such contestant shall sit down. The same word shall not be given to the next contestant. The last one to spell down shall be the winner, the next to the last shall win second place, and the third from the last shall win third place. In case of ties, additional words shall be pronounced until the tie is broken..

7. *Judges.*—The person in charge of the spelling contest shall appoint three judges to whom disputed points shall be referred

RULES IN INDUSTRIAL CONTESTS.

The holding of Industrial Contests is left wholly to the discretion of the county directors.

1. *Eligibility.*—The contests shall be open to any students either boys or girls, in a school that gives courses in agriculture or domestic science that are approved by the University of Texas or the Agricultural and Mechanical College, provided all contestants can qualify under the eligibility rules as contained in the Constitution and Rules and that the school which they represent be a member of the University Interscholastic League

2. *Contests.*—There shall be contests in live stock judging, corn judging, cotton classing, and domestic science. In live stock judging there shall be four classes: two classes of horses (draft and light weight), and two classes of cattle (beef and dairy); there shall be two classes of corn (white and yellow); there shall be one class of cotton; there shall be three classes in domestic science; making biscuits, judging bread, and patching a three-cornered tear cotton cloth.

3. *Class.*—Four animals, four ten-ear samples of corn, and fifteen or twenty samples of cotton, shall each constitute a class

4. *Contestants.*—Each school eligible for the contest may enter not more than two teams composed of three pupils each. No communication shall be allowed during the contest. The placings of animals shall be written on cards. Notes may be taken while examining the animals, but may not be consulted while giving reasons. The judging shall be from the standpoint of utility only.

In the corn judging contests each contestant shall be required

(a) to place the five best ears in order of merit in an exhibit of ten ears of two varieites of corn and give reasons for placing.

(b) to place four ten-ear exhibits of each of two varieties in order of merit and give reasons for placing.

In the cotton classing contest each contestant shall be required to classify the samples and give reasons for five placings

5. *Officials.*—Arrangements have been made whereby com-

petent officials may be secured for all industrial contests. Application for such officials should be made to the State Chairman of the University League at least six weeks before the county meet. Wherever there is a county demonstration agent there should be no trouble to secure a competent official.

6. *Time for Placings.*—Not more than twenty minutes shall be allowed for the placing in each judging event and not more than five minutes for each contestant to give reasons for his placing. The reasons given shall be oral, although the official judge may, at his own discretion, require written reasons.

[*Note.*—It is suggested that the judge explain his placings to the contestants in order that they may derive real benefit from the contest.]

7. *Suggestion.*—Proper preparation cannot be made for these contests without previous practice. In this preliminary work there is nothing of more importance than the score card. It should be used much in the beginning, and continually until the information it contains becomes second nature with the contestant. In 1918 these contests will be confined to the county.

GEORGETOWN HIGH SCHOOL TRACK TEAM
Winners in Class A High School Division

RULES IN ATHLETICS.

(For detailed rules regarding track events and officials, you are referred to the A. A. U. Rules, published by Spalding Bros., Dallas.)

I.

FOOTBALL.

1. *Eligibility.*—In all football games between members of this League, the eligibility rules laid down in Article VIII of the Constitution of the League shall be strictly observed.

2. *Schedule.*—In each district there should be a meeting of representatives of the schools interested in the football contest to arrange a schedule and adopt such other provisions as may be necessary to meet local conditions. This meeting should be called by the district athletic director, in case there is no other duly authorized body to call such meeting, and should be called for the earliest practicable time.

3. *Number of Games.*—Not more than six games shall be considered in determining the district championship, but no team shall be considered for the district championship unless such team has played at least four games with other teams in such contest.

4. *Officials.*—Unless otherwise agreed upon, the referee and head lineman shall be selected by the school on whose grounds the game is played, and the umpire shall be selected by the visiting team; *provided,* that in no case shall a coach or other person connected with either team be an official except with the consent of the other team.

5. *Protests.*—A protest must be made to the director in charge within twenty-four hours after a game is played, except that a protest based on the alleged ineligibility of a player may be made at any time during the football season; *provided,* it is made immediately upon discovery of the facts on which the protest is based. Protests must be made in writing.

II.

BASEBALL.

1. *Eligibility.*—The eligibility rules laid down in Article VIII of the Constitution shall be strictly observed in all baseball games between members of this League, and in addition the following rule shall be enforced: No one shall take part in any baseball game between members of this League who has ever taken part in a game as a member of a team in a regularly organized professional league.

2. *Schedule.*—(Same as Rule 2 for football.)

3. *Number of Games.*—In determining a county or district championship, not more than eight nor fewer than six games shall be considered. No games shall be considered which are not played with other teams in such contest.

4. *Officials.*—The umpire shall be selected by the school on whose grounds the game is played, *provided,* that no coach or other person connected with such team shall act as umpire without the consent of the other team.

5. *Forfeiture of Game.*—In case of willful violation of any of the eligibility rules of this League, the game in which such violation occurred shall be awarded to the team which did not violate said rules. The teams violating the rules shall, in addition, be suspended from further participation in the baseball games of this League during the remainder of the season.

6. *Protests.*—(Same as No. 5 in Rules for football.)

III.

BAKET BALL.

1. *Rules.*—All basket ball games between members of this League shall be played by the Official Basket Ball Rules as published in the Spalding Athletic Library.

2. *Eligibility.*—(See Article VIII of the Constitution.)

3. *Schedule.*—(Same as No. 2 in Rules for football above.)

4. *Number of Games for District Championship.*—Not more

than eight games played by a given team shall be considered in determining the claim of such team for the district championship, nor shall a team be eligible to be considered for the district championship that has not played at least four games with at least three other teams in the district contest.

5. *County Basket Ball Contest.*—The county athletic director should call a meeting of representatives of schools interested in basket ball, at the time of the Teachers' Institute, or at the earliest convenient time thereafter. At such meeting the following matters should be determined: (a) Shall both junior and senior contests be held? Both girls' and boys' contests? (b) When shall the first championship game be played, i. e., what shall be the earliest date for official games in the championship contest? (c) What shall be the method for determining the championship, the percentage method, or the elimination method? (d) What shall be the minimum number of games and the minimum number of teams that each team must play? (e) What prizes shall be given the winners? If possible, a complete schedule should be made out at this meeting. It will usually be found advisable to divide the county into four or more districts, and after the district championships have been determined, to let the winners play the finals at a centrally located place, either at the time of the final county contests in debate, declamation etc., or, where so many events cannot be well handled together to have the basketball championships settled a week earlier. Each team should send a report of each game to the county athletic director, promptly.

6. *Protests.*—A protest of a game must be made in writing to the county athletic director, within twenty-four hours after the game has been played. The county athletic director shall either sustain or disallow the protest promptly after having given an opportunity to the other team to present its side of the case. The ruling of the county athletic director may be appealed, first, to the County Executive Committee, and finally to the State Executive Committee. No protest shall be considered which does not contain evidence to support the charges made.

IV.

TENNIS.

1. *Eligibility.*—The eligibility rules laid down in Article VIII of the Constitution of this League shall be strictly observed in all tennis contests in this League.

2. *County Contest.*—Each school in the League may enter a team in the county contest in doubles, to be held at the time of the annual meeting of the League.

3. The winning team in each county contest may enter the district contest, to be held at the time and place of the annual district meeting of the League.

4. Each winning team in the district contests may enter the final State contest, to be held at the University of Texas on the first Thursday, Friday and Saturday in May.

5. *Number of Sets.*—In all preliminary matches in the county, district, and State contests, the best two out of three sets shall determine the winners, but in all final matches the best three out of five sets shall determine the winners.

6. It shall be the duty of each team desiring to enter the county contest to notify the county athletic director, giving names of the players and a certificate of their eligibility signed by the principal or superintendent, at least one week before the time of such contest. Furthermore, each winning team in a county or district contest shall at once notify the athletic directors of the next higher contest, sending names and eligibility certificates of the players.

7. *Officials.*—The athletic director in each contest shall provide a manager and the proper number of referees for such contests.

8. *Singles.*—By permission of the respective committees and by agreement among the contestants, the players who participate in the county or district contest in doubles may also hold a contest in singles. Also, the players who participate in the State contest in doubles may, by arrangement with the State director of athletics, participate in a State contest in singles.

V.

TRACK AND FIELD EVENTS FOR GIRLS

1. At the final county meeting of the League, the following shall be the official list of track and field events for girls, and they shall be held in the order as given in this rule, track events being held simultaneously with field events: (J for junior, S for senior)

TRACK.

1. Potato race (J).
2. Potato race (S).
3. 30 yards dash (J).
4. 30 yards dash (S).
5. 140 yards relay (J).
6. 140 yards relay (S).

FIELD.

1. Basket ball throw for distance (S).
2. Standing broad jump (J).
3. Basket ball throw for distance (J).
4. Baseball throw for accuracy (S).
5. Baseball throw for accuracy (J).

2. *Points.*—In each event, the first four places shall count, respectively, five, three, two, and one point, *except,* (1) where only four teams are in the relay, third place shall count one point and fourth place shall not count; (2) where only three are in a given event, third place shall count one point.

3. *Rules Governing the Events:*

(a) *Potato Race.*—A contestant must run from the starting line to a basket twelve yards distant and, getting one potato at a time, distribute them in three circles placed three yards apart the first circle being three yards from the starting line. After placing a potato in circle No. 3, the runner must race to the starting line, then return and replace the potatoes one at a time in the basket in the order in which they were distributed, going

around the basket each time a potato is placed in it. The finish of the race is across the starting line.

(b) *30 yards dash.*—See rules for dashes in A. A. U. Rule Book.

(c) *140 yards relay.*—Each team shall have four runners, each runner going 35 yards.

(d) *Basket ball throw for distance.*—The thrower must stand back of a line and throw with one hand. She must not step over the line before or after throwing.

(f) *Baseball throw for accuracy.*—On a vertical board 20 feet distant, shall be drawn two concentric circles 6 and 12 inches respectively, in diameter. The thrower must stand and throw with one hand. She must not step over the line before or after throwing. The one hitting nearest the center of the circles on three trials shall win first place.

4. *Number of entries.*—Only three entries from each school shall be allowed in each event, except that four entries shall be allowed in the relay.

VI.

JUNIOR TRACK MEET FOR BOYS

1. At the final county meeting of the League, and also at each district meeting where a district junor track meet is provided for by the district committee, the official list and order of track and field events for junior boys shall be as follows (Track events, jumps and vaults, and weight events, should be held simultaneously):

TRACK.

1. Potato race.
2. 50 yards dash.
3. 220 yards dash.
4. 100 yards dash.
5. 440 yards relay.

JUMPS AND VAULT.

1. Running high jump.
2. Running broad jump.
3. Pole vault.
4. Running hop-step-jump.

WEIGHTS.

1. Putting 8-pound shot.
2. Baseball throw for distance.
3. Chinning bar.

2. *Points.*—The first four places in each event shall count respectively, five, three, two, and one point, *except:* (1) where only four teams are in the relay, third place shall count one point and fourth place shall not count; (2) where only three are in a given event, third place shall count one point.

3. *Rules Governing the Events.*—The same rules shall apply for juniors as for seniors, viz., those found in the Official A. A. U. Rule Book.

4. Juniors are allowed to compete in the senior contests, but they are not eligible to the same events in both divisions.

5. *No State Junior Meet.*—No State Track and Field Meet for Juniors shall be held.

VII.

TRACK MEET FOR ACADEMIES, CLASS A AND CLASS B HIGH SCHOOLS

1. *State and District Meets.*—The rules in this Article shall be observed in the District Meets and in the Final State Track Meet held at the University of Texas on the first Friday and Saturday in May; also in the county meet, insofar as they may be applied. (*Note.*—In counties where there are no more than two Class A schools there shall be held senior and junior contests in athletics and all contestants regardless of Class A and B divisions shall enter the senior or junior divisions.)

2. *Academy Meet.*—The State Meet for academies shall be held on the afternoon of Friday. The events and the order of same shall be as given for Class A High Schools.

3. *Points.*—In all track meets held by this League the first four places in each event including the relay shall count, respectively, five, three, two, and one point, *except;* (a) if only four teams are in the finals in the relay, third place shall count one point and fourth place shall not count at all; (b) if only three men are allowed to qualify for the finals in a given event third place in that event shall count only one point. In figuring individual honors a man's record on the relay team shall also be counted; for instance, each man on the winning team will receive one and one-fourth points for individual honors, etc.

4. *Events.*—The events, with the order in which they shall be held, for the Final State Meet, shall be as follows:

CLASS A HIGH SCHOOL AND ACADEMY DIVISIONS

TRACK.

1. 120 yards low hurdle.
2. 100 yards dash.
3. 1-mile run.
4. 220 yards low hurdle.
5. 440 yards dash.
6. 220 yards dash.
7. 880 yards run.
8. 1-mile relay.

FIELD.

1. Pole vault.
2. Running broad jump.
3. Running high jump.
4. 12-pound shot put.
5. Discus.

CLASS B HIGH SCHOOL DIVISION.

TRACK.

1. 120 yards low hurdle.
2. 100 yards dash.
3. 1-mile run.
4. 50 yards dash.
5. 220 yards dash.
6. 880 yards run.
7. 1-mile relay.

FIELD.

1. Running broad jump.
2. Running high jump.
3. Pole vault.
4. 12-pound shot put.
5. Discus.

Note.—The hammer throw has been eliminated because it is too dangerous. Particularly in the county meets this event should in no case be permitted.

5. *Preliminaries and Finals.*—The preliminaries of the Final State Meet, and also such semi-finals as may be necessary, shall be held on Friday. The finals for academies shall be held on the afternoon of Friday, and the finals for Class A and Class B High Schools on the afternoon of Saturday.

6. No change shall be made in the order of events as printed herein within one month of the date of the meet.

7. *Representation to Final Meet.*—Any school in the League may send a team of not over eight men to the final meet, but rebate on railroad fare shall be allowed only to those who qualify under Section 5 of Article IX, and to no more than five from one school.

8. *Number in Each Event.*—Each school shall be allowed not over three men in each event, excepting the relay which requires four men.

9. *Number of Events One Man May Enter.*—No contestant shall be allowed to compete in more than four running events including the relay, and in not over five events altogether.

10. *Eligibility.*—In all track meets held by this League, the eligibility rules as laid down in Article VIII of this Constitution shall be strictly observed.

11. *Entries for Final Meet.*—At least ten days before the first day of the final meet, each school desiring to compete in said final meet shall send to the Director of Interscholastic Athletics, University, Austin, Texas, by registered mail, a list of entries, showing each event for which each man is entered, and accompanying such list with an entry fee of 25 cents for each event in which each man is entered. This list shall be signed by the principal or other acting head of the school, and shall be on the official entry form furnished by the State Director of Interscholastic Athletics. This form shall contain a certification by the principal or other acting head of the school, that each man so entered is eligible to compete under the rules of eligibility in Article VIII of the Constitution of the League.

12. *Closing of Entries.—No entries shall be allowed for said final meet which are not mailed to the Director on or before the tenth day before the first day of the meet.*

13. *No Changes in Entries Allowed.*—No changes in the entry lists as sent in, as per Rule 11 above, shall be allowed, except that a man may be substituted for another in an event, provided the substitute is otherwise eligible.

14. *Must Qualify in Preliminaries.*—No contestant shall be allowed to compete in the finals in any event who did not compete in the preliminaries and semi-finals of that event. This rule applies to the relay as well as to other events.

15. *Must Be On Hand at Time Announced.*—The Manager of the Meet shall see that the preliminaries and the finals start at the time announced for them. No excuse shall be accepted for failure of a team or contestant to appear at the time announced for the meet to start, and any contestant who fails for any reason to be on hand at the time of the preliminaries shall forfeit his right to compete either in the preliminaries or the finals.

16. *Withdrawals.*—No entry fees shall be returned for any withdrawals from events unless the Director receives notice of such withdrawals at least five days before the meet.

17. *Officials.*—The University Director of Interscholastic Athletics shall have general charge of the final meet, and the county and district athletic directors shall have charge of the county and district meets, respectively. It shall be the duty of such directors to provide officials, secure entries, arrange programs, and attend to such other matters as may be required for the proper conduct of the meets.

(b) Each meet shall be under the direction of: The director of athletics, one referee, two or more inspectors, three or more field judges, four or more judges of the finish, three or more time-keepers, one starter, one clerk of the course, one scorer, one clerk of the field, one marshal, and one announcer, and such assistants to these officials as may be necessary.

18. *Protests.*—All protests shall be made to the Director within 24 hours after the meet. A protest must be accompanied or followed promptly with a statement of evidence. The Director shall decide a protest within 24 hours if possible, and in any case within one week.

19. *Coaches Not Allowed on Field.*—At the Final State Meet, no coach or other representative of a team shall be allowed on the field. The Director shall provide a tent or other inclosure where the coaches may look after the needs of the contestants.

20. *Certificate for Rebate.*—The principal of each school having one or more men to qualify for rebate under the provisions of Section 4 of Article IX, shall notify the State Director of Interscholastic Athletics of this fact immediately after such contestants have qualified for the rebate.

APPENDIX

PRIZES IN FINAL CONTESTS.

In the literary events—debate, declamation and spelling—committees of the State Federated Women's Clubs will undertake to furnish cash prizes of $25.00 each in amount to winners of first places in the final contests at the University. Other State prizes awarded in connection with the various contests are as follows:

1. *Debate.*—The Eugene Harris silver cup to the school represented by the winning team, and debating scholarships to the members of teams winning first and second honors.

2. *Boys' Senior Declamation.*—The Wozencraft silver cup.

3. *Boys' Junior Declamation.*—The Dallas News silver cup, and $25 in books offered by Hinds, Hayden & Eldredge.

4. *Girl's Senior Declamation.*—The Eli Hertzberg silver cup.

5. *Girls' Junior Declamation.*—Mr. Leith Bryan, of Timpson, offers a solid gold medal to the State winner in this contest.

6. *Boys' Rural School Declamation.*—A silver loving cup.

7. *Girls' Rural School Declamation.*—A silver loving cup.

8. *Spelling.*—The Carl Mayer silver cup.

9. *Essay Writing.*—The University silver cup; and a set of Mark Twain's Works, offered by Dr. H. T. Musselman, Editor of the *Texas School Journal.*

10. *In Academy Track Meet.*—The A. G. Spalding silver cup.

11. *In High School Track Meet.*—A silver loving cup, offered by the Stelfox Company, Austin.

12. The following trophies and medals are donated by Caswell & Smith, of Austin, dealers in athletic goods:

For winning track team in Class B High School Division: silver loving cup.

For winning team in tennis doubles: silver cup.

For winning relay team, Academy Division: silk banner.

For winning relay team, Class A and Class B High School Divisions: silk banner.

The silver cups are to be in the custody of the winning schools for one year, and a cup must be won by the same school three years in succession in order to entitle that school to permanent possession of the same.

Gold, silver, and bronze medals for first, second, and third place winners, respectively, are awarded in each event of the track meet, and in declamation, essay-writing, and spelling; also gold and silver medals to winners of first and second place in tennis and debate, and a souvenir pin to each delegate to the annual State Meeting.

CONTESTANTS IN DEBATE

Abilene High School
Harry Dudley
Homer Trantham

Austin High School
Bledsoe Payne
Dennis Macken

Alpine High School
Emory Purcell
James Hancock

Clarendon High School
Claude Ferebee
Collis Stocking

Corpus Christi High School
Howell Ward
Holworthy Heath

Denton High School
Fay Tucker
Luther Hamilton

El Campo High School
Wilbur Stallworth
James Watt

El Paso High School
Mott Rawlings
Willard Brown

Flatonia High School
Estill Bloodworth
Oscar Brown

Floydada High School
Edward Oden
Ford Butler

Graham High School
Reno Stinson
Floy Henson

Houston High School
Harry Dow
Louis Ehrenfeld

Jasper High School
Merwin Ratcliff
Charles Pollard

Madisonville High School
Jerome C. Thomas
James Richey

Marshall High School
John Taylor
Willis Snyder

Memphis High School
Milford Rouse
Temple Deaver

Midland High School
Willie Epley
Reuben Collins

Mineral Wells High School
E. Rogers
C. Wewurka

Mission High School
Miller Armstrong, Jr.
Olin Scroggin

Oak Cliff (Dallas) High School
Frank Moran
Lowell Brown

Reagan High School
Milton Davison
Terry Dickens

Santa Anna High School
Coleman Gay
Jasper McLelland

San Angelo High School
Barton Pratt
Guy Mobley

San Antonio High School
Oscar Wolfe
Carnot Allen

San Marcos Baptist Academy
Ben Copas
Holland Dykes

Sulphur Springs High School
Ewel Ward
Marvin Thomas

Texarkana High School
Mastine White
Lyle Cashion

Timpson High School
Burnet Moses
Marvin Fitz

Tioga High School
Elwyn Hardy
Orus Stephens

Uvalde High School
Dow Heard
Sterling Evans

Tyler High School
Loye Owen
John Baird

Waxahachie High School
Lackey Connally
Edwin Harding

FINALS

Oak Cliff High School
Frank Moran
Lowell Brown

Tioga High School
Elwyn Hardy
Orus Stephens

CONTESTANTS IN BOYS' SENIOR DECLAMATION

Alpine High School.....Hatley Van Sickle
Amarillo High School.....Charles Ferguson
Austin High School.....Judson Francis
Corpus Christi High School.....Chester Chambers
Detroit High School.....Richard Bailey
El Campo High School.....Paul Franke
El Paso High School.....Ervin Schwartz
Greenville High School.....Leslie G. Jordan
Jacksboro High School.....E. M. Dandson
Jasper High School.....Kern Braswell
Kyle High School.....Don Lee Harwell
La Feria High School.....Homer Ferguson
La Grange High School.....Abe Alexander
Longview High School.....Noble White
Midland High School.....Oran Collins
Mineral Wells High School.....Charles Williams
Navasota High School.....Hulen Calloway
Nocona High School.....Tom Walker
Plainview High School.....Edwin McMath
Plano High School.....Jimmie Rooks
Richmond High School.....Thomas Meyers
San Angelo High School.....Russell Birdwell
San Antonio High School.....Henry Herndon
Santa Anna High School.....Temple Holland
Snyder High School.....Garner Hutcheson
Teneha High School.....June Bell
Texarkana High School.....Atticus Fair
Tyler High School.....Lewis Cacir
Waco High School.....Blake Johnson
Waxahachie High School.....Homer Hendricks
Wellington High School.....Clyde Riley
Uvalde High School.....Murray Smyth

FINALS (FRIDAY NIGHT)

Edwin McMath.....Plainview High School
"The Law of Service"

Jimmie Rooks.....Plano High School
"The National Flag"

Homer Hendricks.....Waxahachie High School
"Masters of the Situation"

Ervin Schwartz.....El Paso High School
"Darrow's Speech in Defense of William D. Haywood"

Blake Johnson.....Waco High School
"The New South"

Henry Herndon.....San Antonio High School
"The Incarnation of the American Spirit"

Winner: Henry Herndon, San Antonio.
Second: Edwin McMath, Plainview.
Third: Blake Johnson, Waco.

GIRLS' SENIOR DECLAMATION

Alpine High School.....Nina Belle Caldwell
Anderson High School.....Elizabeth Siddall
Atlanta High School.....India Hughes
Austin High School.....Rachel Guyot
Bowie High School.....Alta Shaw
Brazoria High School.....Bernice Wallace
Brownsville High School.....Georgia Dancy
Brownwood High School.....Pauline Ragsdale
Colorado High School.....Hallie Roddy
Clarendon High School.....Mabel Richards
Corpus Christi High School.....Ruth Mayfield
Denison High School.....Cleo Elkins
Diamond Hill School, North Fort Worth....Georgia Holman
Duncanville High School.....Inez Brandenburg
El Paso High School.....Mary Kelley
Floydada High School.....Marie Henry
Humble High School.....Nellie Peters
La Grange High School.....Agnes Frede
Memphis High School.....Juanita Adair
Mexia High School.....Jane Jackson
Miles High School.....Gertrude Thiele
Odessa High School.....Flora Belle Thane
Orange High School.....Mavis Roane
Pineland High School.....Bertha Owens
San Antonio High School.....Edith Schneider
San Marcos Baptist Academy.....Mary Brown
Strawn High School.....Kate Vernon
Texarkana High School.....Esther Milton
Tyler High School.....Elizabeth Smiley
Uvalde High School.....Hallie Hill
Waco High School.....Loreene Hamilton
Wolfe City High School.....Iris Shuford

FINALS (SATURDAY)

1. Cleo Elkins.....Denison
"Star Spangled Banner"

2. Juanita Adair.....Memphis
"The Pan-American Policy"

3. India Hughes.....Atlanta
"The Christian Use of Wealth"

4. Jane Jackson.....Mexia
"Moral Courage"

5. Mary Kelley.....El Paso
"Function of Scholarship"

6. Loreene Hamilton.....Waco
"The New South"

7. Edith Schneider.....San Antonio
"Call to Arms"

8. Mary Brown.....San Marcos B. Academy
"The Power of Right"

FINAL HONORS

Edith Schneider, first; Jane Jackson, second; and Mary Kelley, third.

BOYS' JUNIOR DECLAMATION

Abilene High School.....Gordon Weir
Asherton High School.....Clifton Jones
Balmorrhea High School.....John Gill
Bastrop High School.....Claude Miley
Bellville High School.....Oran Jacobs
Bonham High School.....Paul Lindsey
Clarendon High School.....Tom Connally
Corpus Christi High School.....William Thompkins
El Paso High School.....Leon Kotosky
El Campo High School.....Marshall LaRue
Everman High School.....Robert Orr
Flatonia High School.....James Gosch
Karnes City High School.....Arthur Stierson
Kyle High School.....Terrell Sledge
Kountze High School.....Dick Richardson
Lubbock High School.....Lawrence Bacon
Maple Lawn School, Dallas.....Forest McCutcheon
Marfa High School.....Donald Church
Marshall Ward School.....Gordon McGee
Memphis High School.....Lovic Thompson
Mt. Vernon High School.....Leroy Reeves
Nacogdoches High School.....Alton Thomason
Palestine High School.....Earl Selman
Petrolia High School.....John Hines
Richmond High School.....Isador Avnet
San Angelo Central School.....Loyd Steger
San Benito High School.....James Collins
Santa Anna High School.....Reuben Gayden
Temple High School.....Paul Spencer
Thornton High School.....Reg Gray
Weatherford High School.....A. Burns
Wills Point High School.....Charles Christenson

FINALS (FRIDAY)

John Hines.....Petrolia High School
"The New South"

Paul Lindsey.....Bonham High School
"Life's Lessons"

Gordon McGee.....Marshall (Ward) School
"I Am an American"

Alton Thomason.....Nacogdoches High School
"Happiness and Liberty"

Leon Kotosky.....El Paso High School
"Happiness and Liberty"

Terrell Sledge.....Kyle High School
"The War and the Common People"

Winner: Alton Thomason, Necogdoches.
Second: Leon Kotosky, El Paso.
Third: Terrell Sledge, Kyle.

CONTESTANTS IN SPELLING

Alamo Heights School, San Antonio.....George Carver
Angleton High School.....Katie Lee Farmer
Aspermont High School.....Ora Nell Thomas
Bastrop High School.....Marguerite Jones
Belton High School.....J. C. White
Bonham High School.....Etta Madrey
Brownwood High School.....August Hoffman
Celtic High School.....Owen Smith
Clements High School.....Leroy Dugger
Corpus Christi High School.....Julia Bowen
Devine High School.....Fay Robertson
Everman High School.....Mary Eva Gardner
Georgetown High School.....Opal Reed
Gomez High School.....Garland Miller
Gonzales High School.....Collins Vernor
Grapeland High School.....Chester Brown
Knickerbocker High School.....Velma Cockburn
Kurten High School.....Lessie Lawless
La Grange High School.....Stella Amberg
Leonard High School.....George Elam
Malta High School.....Archie McNeeley
Marshall High School.....Hilda Berglund
Rock Island School.....Millie Tedford
Meridian High School.....Willie May Gandy
Midland High School.....Elsie Barron
Minden High School.....M. Redding
Mount Vernon School.....Margaret Puckett
Oakhurst High School.....Bernice Black
Panhandle School.....Oma Cannedy
Perkins High School.....Pansy Stewart
McKinney High School.....Hadenah Dennis

Round Timbers School.....Perk Longly
San Benito High School.....Minnie Carpenter
Sanderson High School.....Onis Vineyard
Sour Lake High School.....Rosa Mullen
Sherwood High School.....Buford McDougle
Watt High School.....George Walker
Ysleta High School.....Lucile Alderete

FINALS (FRIDAY)

Winner: Minnie Carpenter, San Benito.
Second: J. C. White, Belton.
Third: Rosa Mullen, Sour Lake.

CONTESTANTS IN TENNIS

Brazoria High School
Lee Otis Stanger
Geo. Badge, Jr.

Brownsville High School
Leon Hinkley
Carl Weller

Brownwood High School
Tom Wilkinson
Jesse Daniels

Cameron High School
Clifton Rogers
George Childress

Clarendon High School
Roger Store
William Clifford

Corpus Christi High School
Spohn Welch
Leslie Coleman

Denison High School
Wayma Hadley
Barry Reynolds

Greenville High School
Barney Priest
David Mason

Groesbeck High School
Ernest Robertson
Blailock Strickland

Hondo High School
Charles Wilson
J. H. Wilson

Jacksonville High School
Fleming Newton
Merle Gragard

Kemp High School
B. Dickson
H. Hannon

Kyle High School
Jack Sledge
Newton Milholland

La Grange High School
Wright Thomas
Cecil Kirk

Lubbock High School
Weyland Sanders
Lois Haley

Madisonville High School
James Christian
Freeman Heath

Marfa High School
George Morgan
Elsworth Share

Marlin High School
Billie Spivey
Tom Glass

Marshall High School
Alexander Field
Thomas Taylor

Mount Pleasant High School
Jack Brown
Randolph Debenport

San Angelo High School
John Smith
Homer Mason

Sweetwater High School
Ernest Scales
Stewart Bright

Stockdale High School
Rufus Bell
George White

Timpson High School
Jennings Bryan
Dudley Pittman

Winners: Corpus Christi.
Second: Greenville.

SCHOOLS REPRESENTED IN THE SEVENTH ANNUAL MEET OF THE UNIVERSITY INTERCHOLASTIC LEAGUE

Abilene High School
Alpine High School
Alamo Heights School (San Antonio)
Alief High School
Amarillo High School
Anderson High School
Angleton High School
Athens High School
Atlanta High School
Aubrey High School
Asherton High School
Aspermont High School
Austin High School
Balmorrhea High School
Bastrop High School
Beaumont High School
Bells High School
Bellville High School
Belton High School
Blanket School
Bonham High School
Bowie High School
Brazoria High School
Brownsville High School
Brownwood High School
Buda High School
Cameron High School
Carrizo Springs High School
Celina High School
Center High School
Chester High School
Clarendon High School
Clemens High School
Colorado High School
Commerce High School
Cost High School
Cooper High School
Corpus Christi High School
Dallas High School
Danville High School
Denison High School
Denton High School
Devine High School
Detroit High School
Diamond Hill School
Duncanville High School
Edgewood High School
Edinburg High School
El Campo High School
Elgin High School
El Paso High School
Everman High School
Ferebee School
Floydada High School
Franklin High School
Frost High School
Georgetown High School
Gonzales High School
Graham High School
Granbury High School
Grandview High School
Grapeland High School
Greenville High School
Groesbeck High School
Hardin School (Dallas)
Hillsboro High School
Hondo High School
Houston High School
Humble High School
Jacksboro High School
Jacksonville High School
Jasper High School
Justiceburg School
Kaufman High School
Kemp High School
Kenedy High School
Kilgore High School
Kirkley School (Greenville)
Knickerbocker High School
Kountze School
Kurten High School
Kyle High School
La Feria High School
Leroy School
Liberty Hill School
Llano High School
Lockhart High School
Longview High School
Loraine High School
Lubbock High School
Lytton Springs High School
Main Avenue High School (San Antonio)

Malta High School
Marfa High School
Marshall Ward School
Marlin High School
Madisonville High School
Marshall High School
Maple Lawn School (Dallas)
Matador High School
Memphis High School
Meridian High School
Mexia High School
Midland High School
Miles High School
Mineral Wells High School
Mission High School
Mt. Calm High School
Mt. Pleasant High School
Mt. Vernon High School
Nacogdoches High School
Nocona High School
Navasota High School
North Side Junior High (Houston)
Oak Cliff High School
Oakhurst High School
Oakville High School
Odessa High School
Palestine High School
Pecan Gap High School
Perkins High School
Pharr High School
Pineland High School
Plainview High School
Plano High School
Pleasanton High School
Post City High School
Quanah High School
Reagan High School
Reilly Springs High School
Richmond High School
Robert Lee School
Roscoe High School
Rosebud High School
Rosenberg High School
Rusk High School
San Angelo High School
San Angelo Central School
San Benito High School
Sanco High School
Sanderson High School
Santa Anna High School
San Marcos Baptist Academy
San Marcos High School
Shafter High School
Sherwood High School
Smithville High School
Stamford High School
St. Edwards Academy
Stockdale High School
Snyder High School
South Ward School (Dallas)
Sulphur Springs High School
Sweetwater High School
Temple High School
Tenaha High School
Texarkana High School
Thornton High School
Timpson High School
Tioga High School
Tokio High School
Tyler High School
Union High School
Uvalde High School
Waco High School
Watt High School
Waxahachie High School
Weatherford High School
Wellington High School
West Point Rural School
Wichita Falls High School
Wills Point High School
Wolfe City High School
Woodville High School
Yancy High School
Ysleta School

DISRICT AND COUNTY HONORS IN POINT OF MEMBERSHIP IN THE LEAGUE IN 1916-17

Districts

First: Sweetwater District, 198 schools.
Second: Navasota District, 127 schools.
Third: Waco District, 126 schools.

Counties

First: Parker County, 49 schools.
Second: Falls County, 48 schools.
Third: Shelby County, 41 schools.
Garza County enrolled all its schools.

STATE RECORDS IN DEBATE

Year	First Place	Second Place
1911	Edward Freeman and Frank Lyons, of the El Paso High School	Theo. Willis and Frank Young, of the Honey Grove High School
1912	Willis McGregor and Arthur Lee Moore, of the Fort Worth High School	Floyd Betts and Cecil Glass, of the Marlin High School
1913	Wayne R. Howell and Richard Senor, of the Corsicana High School	Rex Hendrix and Joe B. Lowry, of the Bonham High School
1914	Wayne R. Howell and Homer Watson, of the Corsicana High School	Gilbert Lang and Henry Taylor, of the San Antonio High School
1915	Ernest May and Jack Porter, of the Weatherford High School	Erle Racey and Frank Sparks, of the San Antonio High School
1916	Ted Myers and Owen Barker, of the Sweetwater High School	E. Wilson and W. Garnet, of the San Marcos Baptist Academy
1917	Frank Moran and Lowell Brown, of the Oak Cliff High School (Dallas)	Elwyn Hardy and Orus Stephens, of the Tioga High School

STATE RECORDS IN DECLAMATION

SENIOR BOYS

Year	First Place	Second Place	Third Place
1912	Jesse W. George, Belton High School	Willis McGregor Fort Worth High School	
1913	Homer Sharpe, Fort Worth High School	Edwin Randall, Anderson High School	
1914	Robert Field, San Antonio High School	Jake Mossiker, Orange High School	
1915	Garland Day, Dallas High School	Adolphus Moore, Leonard High School	Alva McKnight, Center High School
1916	Adolphus Moore, Leonard High School	Henry Herndon, San Antonio High School	Lee Curtis, Belton High School
1917	Henry Herndon San Antonio High School	Edwin McMath, Plainview High School	Blake Johnson, Waco High School

SENIOR GIRLS

Year	First Place	Second Place	Third Place
1916	Leona McCormick, Midland High School	Juanita Adair, New Castle High School	Helen Mather, Austin High School
1917	Edith Schneider, San Antonio High School	Jane Jackson, Mexia High School	Mary Kelley, El Paso High School

JUNIOR BOYS

Year	First Place	Second Place	Third Place
1913	Will Gordon Knox, Floresville High School	Edwin Schwartz, El Paso Schools	
1914	Harry Young, Belton High School	Reid Markham, Farmersville High School	
1915	George Clark, Rosebud High School	Gus McCracken, Floresville High School	Leroy Barlow, Taylor High School
1916	Bruce Rogers, Austin High School	Forest Cook, Somerville High School	Philip Dunklin, Atlanta High School
1917	Alton Thomason, Nacogdoches High School	Leon Kotosky, El Paso High School	Terrell Sledge, Kyle High School

STATE HECORDS IN ESSAY WRITING

Year	First Place	Second Place	Third Place
1915	Walter Garnett, San Marcos Baptist Academy. Subject: "A Panther Scare"	Phyllis Lorig, El Paso High School. Subject: "My Prize Fight"	Mary Louise Hightower, Henderson High School. Subject: "An Embarrassing Moment"
1916	Alice L. Shive, Austin High School Subject: "The Passing of the Mother Land"	Laura Davis, Center High School. Subject: "Feminist Forever"	Rebecca Maltze, El Paso High School. "Preparedness"
1917	Maxwell Ravel, El Paso High School Subject: "Will My Aunt's Will Mention Me?"	Ruth Timmons, Mart High School. Subject: "A Desperate Situation"	Kathryn Ellen Anderson, Brownwood High School. Subject: "My Grey Fox Furs"

STATE RECORDS IN SPELLING

Year	First Place	Second Place	Third Place (Tied)
1916	Harold Shaner, Morrill School	Loyd Rutledge, Tolbert School	Ida Mae Blalock Longview High School Layton Cochran, Sanderson High School
1917	Minnie Carpenter, San Benito High School	J. C. White, Belton High School	Rosa Mullen, Sour Lake High School

STATE RECORDS IN TENNIS DOUBLES

Year	First Place	Second Place
1914	E. Rittenour and C. Walker, Beeville High School	Pittman and Pickens, Fort Worth High School
1915	D. Childress and C. Triggs, Cameron High School	J. Akin and W. Aiken, Wichita Falls High School
1916	Fritz Daniels and Chas. Granger, Austin High School	Lloyd Gregory and Ford Lockett, Beeville High School
1917	Spohn Welch and Leslie Coleman, Corpus Christi High School	Barney Priest and David Mason, Greenville High School

RECORDS OF STATE CHAMPIONSHIP TRACK MEET, 1917

Class A High School Division

Event	First	Second	Third	Fourth	Record
120-yd. low hurdles	Frazier, Hillsboro	Harris, Austin	Sheram, Greenville	Hart, Stamford	14⅘ sec.
220-yd. low hurdles	Frazier, Hillsboro	Sheram, Greenville	Halbert, Stamford	Hart, Stamford	27⅘ sec.
100-yd. dash	Weir, Georgetown	Frazier, Hillsboro	Rawson, Houston	McHenry, Georgetown	10⅕ sec.
220-yd. dash	McHenry, Georgetown	Rawson, Houston	Coers, San Marcos	Morse, Georgetown	24 sec.
440-yd. dash	Goodnight, Lubbock	Pomeroy, Beaumont	Bryan, El Paso	Weir, Georgetown	53⅘ sec.
880-yd. run	Goodnight, Lubbock	Weems, Temple	Fields, Commerce	Grath, Beaumont	2 min. 8⅘ sec.
1 mile run	Goodnight, Lubbock	Wilson, Waxahachie	Weems, Temple	Hall, Beaumont	4 min. 49 sec.
Relay	Austin	Georgetown	Greenville	Waxahachie	3 min. 40 sec.

High jump	Burkhart, Beaumont	Slaughter, Kaufman	Knox, Waco	Bryant, El Paso	5 ft. 6 in.
Running broad jump	Hester, Cost	Jackson, Amarillo	Halbert, Stamford	Bryant, Temple	19 ft. 8¾ in.
Pole vault	Keeling, Temple	Garrett, Waco	Grayum, Snyder	Webb, Temple	10 ft. 6 in.
Shot put	Little, Greenville	Overall, Waxahachie	Coers, San Marcos	Allenson, El Campo	45 ft. 2¼ in.

Summary: Georgetown, 16; Lubbock, 15; Hillsboro, 13; Temple, 13; Greenville, 10; Beaumont, 10; Austin, 8; Waxahachie, 7; Stamford, 6; Houston, 5; Brownsville, 5; San Marcos, 4; Waco, 3½; El Paso, 3½; Amarillo, 3; Snyder, 2; Commerce, 2; Kaufman, 1½; Cost, 1½; El Campo, 1.
Individual Honors: Goodnight (Lubbock), 15; Frazier (Hillsboro), 13.

RECORDS OF STATE CHAMPIONSHIP TRACK MEET, 1917—Continued.

Class B High School Division

Event	First	Second	Third	Fourth	Record
120-yd. low hurdles	Harrison, Flatonia	White, Blanket	Jeter, Cooper	Hundley, Post	15⅕ sec.
50-yd. dash	Lindsey, Timpson	Petty Flatonia	Ward, Yancey	Harrison, Flatonia	5⅗ sec.
100-yd. dash	Lindsey, Timpson	White, Blanket	Ward, Yancey	West, West Point Rural	10⅖ sec.
220-yd. dash	Lindsey, Timpson	Ellis, Liberty	Harrison, Flatonia	Bromillette, Houston	24⅖ sec.
880-yd. run	White, Blanket	Robertson, Llano	Ingle, Grandview	Foster, Flatonia	2 min. 11 sec.
1 mile run	Odell, Celina	Peacock, Edinburg	Kuykendall, Loraine	Choice, Kilgore	5 min.
Relay	El Campo	Franklin	Flatonia	Frost	3 min. 50⅗ sec.
Running high jump	Ellis, Liberty	Reid, Woodville	Odom, El Campo	Slaughter, Kaufman	5 ft. 6 in.

Pole vault	Bryan, Center	Slaughter, Kaufman	Lindsey, Timpson	Duckett, Houston	10 ft. 7¾ in.
Running broad jump	Fogleman, Kaufman	Duckett, Houston	Odom, Pleasanton	Cassaday, Kenedy	19 ft. 7⅛ in.
Shot put	Lindsey, Timpson	Yeary, Center	Odom, Pleasanton	Allenson, El Campo	41 ft. 8¾ in.

Summary: Timpson, 22½; Flatonia, 14; Blanket, 11; Kaufman, 8½; El Campo, 8; Center, 8; Liberty, 8; Houston, 5; Celina, 5; Yancey, 4; Pleasanton, 4; Edinburg, 3; Llano, 3; Franklin, 3; Woodville, 2; Cooper, 2; Loraine, 2; Grandview, 2; Post, 1; Kenedy, 1; Kilgore, 1; Frost, 1; West Point Rural, 1.

Individual Honors: Lindsey (Timpson), 22½; Harrison (Flatonia), and Ellis (Liberty), 8.

RECORDS OF STATE CHAMPIONSHIP TRACK MEET, 1917—Continued.

ACADEMY DIVISION

Event	First	Second	Third	Fourth	Record
120-yd. low hurdles	Lemon, Hardin	Osborne, Hardin	Hare, S. M. B. A.	Mussill, St. Edwards	14⅗ sec.
220-yd. low hurdles	Lemon, Hardin	Hare, S. M. B. A.	Osborne, Hardin	Mussill, St. Edwards	28 sec.
100-yd. dash	Wolf, S. M. B. A.	Kirkgard, Hardin	Lemon, Hardin	Payne, Hardin	10⅖ sec.
220-yd. dash	Wolf, S. M. B. A.	Kirkgard, Hardin	White, S. M. B. A.	Wagerman, St. Edwards	23⅗ sec.
440-yd. dash	Wolf, S. M. B. A.	Kirkgard, Hardin	Hare, S. M. B. A.	Payne, Hardin	54⅖ sec.
880-yd. run	Bain, S. M. B. A.	Porter, S. M. B. A.	Bales, S. M. B. A.	Ballard, Hardin	2 min. 15 sec.
1 mile run	Porter, S. M. B. A.	Bales, S. M. B. A.	Ballard, Hardin	Ende, Kirkley	5 min. 23⅕ sec.
Relay	S. M. B. A.	St. Edwards	Hardin		3 min. 46⅘ sec.

Pole vault	Camp, S. M. B. A.	Youree, Hardin	Osborne, Hardin	Becker, Hardin	10 ft. 6½ in.
High jump	Becker, Hardin	Youree, Hardin	Osborne, Hardin	Bain, S. M. B. A.	5 ft. 3 in.
Broad jump	Lemon, Hardin	Osborne, Hardin	Becker, Hardin	Bales, S. M. B. A.	21 ft. 8 in.
Shot put	Youree, Hardin	Knight, S. M. B. A.	Becker, Hardin	White, S. M. B. A.	43 ft.

Summary: Hardin, 62; San Marcos Baptist Academy, 60; St. Edwards, 7; Kirkley, 1.
Individual Honor: Wolf, 17¼; Lemon, 17¼.

RECORDS OF STATE CHAMPIONSHIP TRACK MEET, 1917—Continued.

ALL-TEXAS HIGH SCHOOL RECORDS

Event	Holder	School	Made In Meet At	Year	Record
50-yd. dash	Betts	Marlin	Univ. of Texas	1913	5⅗ sec.
120-yd. low hurdles	Frazier	Hillsboro	Univ. of Texas	1917	14⅖ sec.
100-yd. dash	Maxon	Beaumont	Univ. of Texas	1912	10⅕ sec.
Mile run	Goodnight	Lubbock	Univ. of Texas	1916	4 min. 41⅕ sec.
220-yd. hurdles	Tucker	Fort Worth	A. and M. College	1912	26⅖ sec.
440-yd. dash	Holt	Marlin	Univ. of Texas	1916	52⅘ sec.
220-yd. dash	Maxon	Beaumont	Univ. of Texas	1912	22⅗ sec.
880-yd. run	Goodnight	Lubbock	Univ. of Texas	1916	2 min. 5 sec.
Mile relay		Greenville	Univ. of Texas	1916	3 min. 37⅗ sec.
Pole vault	Brown	Temple	Univ. of Texas	1915	10 ft. 9 in.

Broad jump	Lemon	Nocona	Univ. of Texas	1915	21 ft. 8½ in.
High jump	Moore	Garner	Univ. of Texas	1916	5 ft. 9½ in.
12-lb. shot put	Collins	Austin	Univ. of Texas	1915	45 ft. 6½ in.
12-lb. hammer throw	Giles	Temple	Univ. of Texas	1915	147 ft. 6 in.
discus throw	Youree	Bowie	Univ. of Texas	1916	113 ft. 1 in.

NOTE: All-Texas Academy records that equal or surpass the high school records are:
50-yd. dash: Goin, Marshall Training School (1910); 5⅘ sec.
100-yd. dash: Goin, Marshall Training School (1910); 10 sec.
440-yd. dash: Goin, Marshall Training School (1911); 52⅘ sec.
12-lb. shot put: Jacks, Marshall Training School (1911); 46 ft. 7½ in.
12-lb. hammer throw: Pigg, Peacock College (1910); 173 ft. 6 in.

B106-617-2m

University of Texas Bulletin

No. 1722: April 15, 1917

Bureau of Economic Geology and Technology
J. A. UDDEN, Director

The Rustler Springs Sulphur Deposits

By
E. L. PORCH, Jr.

Published by the University six times a month and entered as second-class mail matter at the postoffice at AUSTIN, TEXAS

The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston

Cultivated mind is the guardian genius of democracy. . . . It is the only dictator that freemen acknowledge and the only security that freemen desire.

Mirabeau B. Lamar

CONTENTS

	Page
Foreword	7
Introduction	10
Nature of the work done	10
Acknowledgments	12
Geology	13
Deep Explorations	14
Troxell Well No. 2	14
Huling-Ross Well No. 1	18
The Delaware Formation	19
Castile Formation	20
Rustler Formation	21
Red Beds	22
Cretaceous	22
Quaternary	22
Description of Sulphur Deposits	24
Pit in center of Section 34, Block 70	24
Pit in southeast corner of Section 13, Block 70	24
The Johnson Prospect	24
The Kyle Prospect	25
Prospecting on Section 13, Block 113	28
Block 112	29
The Dot Prospect	29
The Spann-Felch Holdings	31
Observations on Felch's gas well, Pit No. 3	33
Summary of log of Hole No. 1, Dallas Claim No. 2	35
The Holdings and Works of the Michigan Sulphur & Oil Company	35
The Georgetown Prospect	45
The Cooksey Prospect	46
The Stinking Seep Prospect	47
Deposits near Walker's Ranch	48
Southeast corner of Section 4, Block 109	48
Southern part of Section 4, Block 109	48
Southwest corner of Section 4, Block 109	49

Page
Southwest quarter of Section 9, Block 109 49
Northeast corner of Section 10, Block 109 50
Prospects on and near the University Lands 50
The Grant Mines Property and Vicinity 51
Open cut on Section 8, Block 61 54
Other Sulphur Locations Reported 55
Types of Sulphur 56
1. Yellow crystallized sulphur 56
2. Yellow massive sulphur 56
3. Green crystallized sulphur 56
4. Green massive sulphur 57
5. Silvery white massive sulphur 57
6. Cream white massive sulphur 57
Kinds of matrix containing sulphur 57
Gypsite 58
Brown siliceous material 58
Dark gypsiferous porous material 58
Massive gypsum 59
Chemical composition of the Sulphur and of its Matrices 59
Sulphur analyses 59
Analyses of the Matrices 60
Probable origin of the sulphur 62
Development 64
Water Resources 67

LIST OF ILLUSTRATIONS.

Plate 1, a. Maverick Springs, looking northeast. Erosion extending into the Castile Formation. Red bed materials show on both sides of this draw, the small hill in the foreground being partly composed of this material. Opp. p. 20.

Plate 1, b. Characteristically weathered and cavernous dolomite (Rustler?) in the Virginia Draw near the Dot Prospect. The hill in the background is covered with gypsite. Opp. p. 20.

Plate 2, a. Dip of the bed rock (limestone or limy dolomite) in the Virginia Draw, near the Dot Prospect. Bank above capped by gypsite. Looking west. Rustler Hills in the distance. Opp. p. 21.

Plate 2, b. Gypsum beds changing upward into gypsite in the Virginia Draw near the Dot Prospect. The gypsum beds are very much broken up. Opp. p. 21.

Plate 3, a. Steam plant for extracting sulphur. Rustler Hills in the background. Michigan Sulphur and Oil Co. Opp. p. 35.

Plate 3, b. Contact between dark, decomposed, cavernous, gypsiferous sulphur-bearing material and the overlying gypsite, a short distance above line drawn to show flexure. Michigan Sulphur and Oil Co. Opp. p. 35.

Plate 4, a. Entrance to the northeast drift at 16 in sketch map. Showing contact between the dark, gypsiferous material and the brown, earthy material above. There is a great deal of kaolin-like sulphur in the dark material. A picked sample from the opposite side of this drift contained 54.4 per cent of free sulphur. Michigan Sulphur and Oil Co. Opp. p. 42.

Plate 4, b. Part of the workings of the Michigan Sulphur and Oil Co. Looking north from the center of the south line of the north forty acres, near the south edge of the depressed area. Extraction plant in the left background. Photograph furnished by Mr. J. G. Townes. Opp. p. 42.

Plate 5, a. Looking south from about the center of the Michigan Sulphur and Oil Co.'s property. Rustler Hills in the background. Gypsite covering in the foreground. Opp. p. 46.

Plate 5, b. Best showing of sulphur on the Cooksey Prospect. Brown earthy siliceous material overlain by a thin capping of gypsite. A picked sample from here contained 41.8 per cent of free sulphur. Opp. p. 46.

Plate 6, a. Furnace on the Cooksey Prospect. Said to have produced 75 tons of sulphur; built about 1900. The foundation of the furnace rests on Castile gypsum. Rustler Hills in the distance. Opp. p. 47.

Plate 6, b. Stinking Seep. Looking to the northwest. A rusty brown incrustation now being deposited here on the gypsite contained 3.2 per cent of free sulphur. Typical Castile gypsum outcrops in the vicinity. Opp. p. 52.

Plate 7. Banded gypsum at the entrance of the incline on the east side of the west hill. Grant Mines Property. Opp. p. 52.

Plate 8, a. Cliff on Delaware Creek, about one mile east of Delaware Springs. May represent the transition beds between the Delaware and the Castile Formation. Alternating limy and shaly beds down to yellow sandstone at the water's edge. There are some 20 feet of finely banded limestone at the top. Opp. p. 62.

Plate 8, b. Typical plain of the Delaware Formation. Looking east from the top of a limestone-capped sandstone mesa. Edge of mesa shows in the foreground. Opp. p. 62.

Plate 9. Map showing locations of the Rustler Springs Sulphur deposits. Next cover.

Figure 1. Sketch map of the Michigan Sulphur and Oil Company's property. P. 36.

FOREWORD.

Early in 1916, as a result of war conditions and the increased demand and higher price obtained for sulphur, the well-known but neglected sulphur deposits of West Texas attracted the attention of promoters and considerable activity was aroused in their development. Many promotion companies were organized, mainly in the North, and much stock was offered for sale both in northern states and in Texas. Inquiries regarding the deposits and the probability of their commercial development were received in this Bureau in such increasing numbers that it seemed desirable that the Bureau should make a detailed investigation of the situation in Culberson county and the adjoining region, and give to the public, in the form of a report from this office, some reliable information regarding the possibilities of the sulphur deposits there.

In accordance with this desire, Dr. Emil Böse and Mr. E. L. Porch, Jr., geologists of this Bureau, were sent out early in November to make the necessary investigation. After having looked over the field and advised with Mr. Porch as to the work to be done, Dr. Böse, according to plans agreed upon, returned to Austin and the work was left in the hands of Mr. Porch, who remained in the sulphur district until the latter part of December. Mr. Porch made a careful examination of as much of the field as the time would allow. The results of his work are presented in his carefully prepared report, which is herewith presented.

Taking a general view of the many and detailed descriptions given by Mr. Porch of the physical conditions indicated by the occurrence of the sulphur itself, and judging by his descriptions of the different materials in which the sulphur is contained, one would appear to be justified in supposing that the original source of the sulphur is to be looked for at considerable depth in the underlying sediments and is most probably to be found in deep-lying Permian and Pennsylvanian shales containing iron pyrite and plentiful organic matter, undergoing slow heating, either from imperceptible tectonic movements or possibly from the existence of intrusive materials not yet cooled to the temperature

of the rocks into which they have been forced. Owing to such existing temperature at depth, hydrogen sulphide and no doubt also other gases, are, perhaps, slowly migrating through the overlying rocks up to the surface and are quietly and slowly escaping at a great number of places in the region. It would be natural that gas escaping in this manner should follow the most pervious places in the underlying rocks. It would also be natural that accumulations of sulphur in the surface material should be found to be generally dispersed surficially and that they should be found near the most pervious passages in the greatest abundance. The sulphur in the surface materials and in such "chimneys" would represent that part of the escaping gases which has been oxidized and reduced before escaping into the atmosphere. The differences in the color of the materials in which the sulphur is now held apparently are due to atmospheric reactions of oxidation and weathering. The darkest matrix, usually lying deepest, as is so clearly set forth by Mr. Porch in his descriptions, probably owes its dark color to the presence of organic material or to finely disseminated iron sulphide, formed by the escaping gas. The brown and reddish matrix, which is found commingled with the darker material, but which in general overlies the latter, probably owes its color to the oxidation of the iron sulphide present in the dark underlying material, and is merely a changed condition of this material, caused by the more ready access of the atmosphere to its uppermost zone. The gypsite, which forms the surface material, is no doubt a true mantle rock distributed by the agency of wind and water, being a mixture not only of transported material on the surface, but also of disintegrated brown and dark sulphur matrix in place, and of precipitates from the evaporation of ground moisture, usually known as caliche.

If we take this view of the origin of these sulphur deposits we have a ready explanation of the quite general distribution of the sulphur in the surface materials. We can also expect that while the surficial material may be found to contain some sulphur almost everywhere, more or less sulphur will also be found extending down to considerable depths in places where the rock has been sufficiently porous to afford ready escape of the gases. This deeper sulphur would form what have been

called in other parts of the world, sulphur chimneys, and some such deposits should also be expected to exist in this field, although explorations up to this time may not have demonstrated their presence.

J. A. Udden.

Austin, Texas.
May, 1917.

INTRODUCTION.

The sulphur deposits considered in this bulletin are located, with three exceptions in the northeastern part of Culberson County, formerly part of El Paso County; the exceptions noted being in Reeves County, about sixteen miles northwest of Toyah. All of the other deposits lie in the area included between latitude 31°-30′ to 32°, and longitude 104° to 104°-30′. Their distances from Orla, the nearest railroad station on the Pecos Valley and Northeastern Railroad, which is about forty-one miles northwest of Pecos, vary from fifteen to forty-five miles, by automobile road. From Carlsbad, New Mexico, it is fifty miles to the nearest sulphur deposit.

The existence of sulphur in this section has been known since 1854, when it was noticed in the bed of Delaware Creek, by William P. Blake, geologist for an expedition sent out by the United States War Department under the command of Capt. John Pope.

A sample taken at the Delaware Springs contained 18.28 per cent. of free sulphur and samples of water from the springs were found to contain, among other things, considerable sodium sulphide.*

Dr. Geo. G. Shumard, under date of Sept. 25, 1855, in "A Partial Report on the Geology of West Texas," Part II, Chapter V, p. 92, mentions the spring at the head of Delaware Creek as containing much hydrogen sulphide. In a paper by W. von Streeruwitz, on "Geology of Trans-Pecos Texas; Preliminary Statement," First Ann. Report, Geological Survey of Texas, 1889, p. 226, sulphur is mentioned as among the list of minerals noted in this region.

In the Third Annual Report of the Geological Survey of Texas, 1891, W. F. Cummins states on page 165 of "A Report on the Geography, Topography, and Geology of the Llano Estacado or Staked Plains" that while camped at Castile Spring, they spent two days in search of a reported bed of sulphur, but

*Explorations and Surveys for a Railroad Route from the Mississippi River to the Pacific Ocean. U. S. War Pepartment, 1853-4, Vol. II, cited in University of Texas Mineray Survey, Bulletin No. 2; Report of Progress for 1901. Sulphur, Oil, and Quicksilver in Trans-Pecos Texas, pp. 27-42.

were unable to locate same. On page 212, he speaks of a spring, highly impregnated with sulphur, and containing hydrogen sulphide, at the head of Delaware Creek. On page 221, he speaks of the flowing well at Toyah, 834 feet deep, which is reported as yielding water impregnated with sulphur and common salt.

Prior to 1896, reports were made on this district by Dr. Eugene A. Smith, Director of the Alabama Geological Survey, and by Mr. John E. Rothwell of Denver, Colorado. Dr. Smith wrote a short account of some of the deposits for "Science." This was published in Vol. III of that journal, No. 70, May 1, 1896.

The whole sulphur situation, in so far as it was known up to that time, was well summarized by Dr. Wm. B. Phillips in the University of Texas Mineral Survey Bulletin No. 2, "Report of Progress for 1901; Sulphur, Oil and Quicksilver in Trans-Pecos Texas," pages 27-42. This report, unfortunately, has been out of print for a number of years. It contains the article written by Dr. Smith, for "Science," and also a report on the whole area, prepared especially for the Mineral Survey by Mr. E. M. Skeats of El Paso, Texas. Mr. Skeats was the first to notice the presence of free sulphuric acid in the waters of this region.

In 1903, Mr. Geo. B. Richardson, of the United States Geological Survey, acting in co-operation with the University of Texas Mineral Survey, did some work on these deposits in connection with the general geologic mapping of this region. The results of his work were published in the University of Texas Mineral Survey Bulletin No. 9, November, 1904, "Report of a Reconnaissance in Trans-Pecos Texas, North of the Texas and Pacific Railway," pages 68-71, by Geo. Burr Richardson.

In the Manufacturers' Record, of Baltimore, Md., December 7, 1916, there appeared an article on "The Sulphur Situation in Culberson County," by Dr. Wm. B. Phillips.

In addition to the reports above enumerated, a number of private reports have been made on this district. Several of these have also been consulted in the preparation of this paper.

The Present Study.

In all, about five and a half weeks were spent in examining this district for the present report. This work was done in the fall of 1916. All of the deposits where work was being done, or

where considerable work had been done in the past, were studied in detail, and all other sulphur occurrences that could be located were visited and examined.

The deposits were examined with special reference to their physical characteristics, and to their geologic relations, and notes were taken on their relations to structure wherever this could be ascertained.

Samples were taken from the various deposits, with the view of securing some general information on the sulphur content of the deposits examined.

The desirability of figuring tonnages where much work had been done was considered, but it was found impracticable, on account of insufficient development, to accomplish any results of value in this direction.

All points that might have any bearing on the possible origin of the sulphur were also carefully looked into, and considered.

Acknowledgments.

The writer wishes to acknowledge the courtesies shown him during the examination of the sulphur deposits, both by the operators and by the residents of the district. Everyone showed the greatest willingness to assist in every way possible, and records and special information about the properties were turned over unstintingly.

He is especially indebted to Mr. F. W. Felch, Mr. C. R. Troxel, Mr. Carr, Dr. Gustav Grossman, Mr. Abernathy, Mr. W. A. Doyle, Mr. M. S. Blackburn, Mr. Voight, Mr. Snell, Mr. Barriger, Mr. Vergil Albritton, Mr. J. A. Martin, Jr., Citizens State Bank of Toyah, Mr. Cooksey, and Mr. Hollebeke. Dr. Wm. B. Phillips of Austin furnished many data on the district and permitted the inspection of several unpublished reports on the district, which he possesses. Mr. C. C. Dana of Amarillo very kindly loaned that part of the files of the Panhandle and Santa Fe Railroad dealing with the sulphur deposits of this district. Dr. Emil Böse was present during the first two weeks of the field work, and gave much helpful advice, based on his wide knowledge of other sulphur districts.

The writer's thanks are especially due to Dr. J. A. Udden for the kindly suggestions made while reviewing the bulletin, and for the revision of several of its parts.

GEOLOGY.

The whole sulphur area is a plain sloping gently to the east, with the Rustler Hills, which trend slightly northeast-southwest, rising some two hundred and fifty feet above the general level of the gypsum plain on the west and the gypsum and alluvial flats on the east. The area is thus divided into three unequal parts; a larger relatively flat plain on the west, a hilly central belt, and a smaller part of flat plain to the east. The term "plain" must be considered advisedly, for we find the land to have many low hills, mesas, and draws, or drainage channels. Some scattered hills in the western side of the area are as high as, or higher than, the main Rustler Hills.

The beds exposed in the area under consideration belong to the following geologic divisions, starting with the youngest:

System	Epoch	Series
Quaternary		Recent
		Pleistocene
Cretaceous	Comanchean	
Permo-carboniferous or Permian		Rustler Formation
		Castile Formation
Permo-carboniferous		Delaware Formation

Structure.

A consideration of the three lowest and most important formations outcropping in this area shows that the general structure is that of a monocline dipping gently to the northeast. Within this monocline, however, there are many local variations of dip forming apparently small and irregular anticlines, synclines, and domes in many places.

These secondary structures are usually small, and seem to be confined to the Castile and Rustler Formations, as the Delaware Formation, where observed, has quite a uniform and persistent dip.

It is believed that the majority of these structures is caused by local effects, probably by slumping of the upper beds, due

to the solution of the supporting gypsum beds below, or to the crumpling of the beds due to the swelling of the underlying anhydrite as it is converted to gypsum. However, it is impossible to say without a much more detailed study, whether some of these structures may not be due to real earth movements.

Deep Explorations.

The underlying rocks in this region are known only from some well records and from examinations which have been made of cuttings from two deep borings. Dr. J. A. Udden has published descriptions of cuttings from Troxel Well No. 1, some 400 feet deep. These descriptions show the presence of gypsum, and of "red beds" at several depths down to the bottom of the boring.* In some of these samples, many foraminifera of decidedly Cretaceous aspect were noted. Dr. Udden has suggested that these may represent fillings of Comanchean material in caverns in the Permian strata of limestone and gypsum. The actual existence of these fossils has lately been corroborated by their occurrence also in the much deeper Troxel Well No. 2, drilled near the first well, as will be seen in the descriptions below. In this well the foraminifera were found about 400 feet below their place in the first well.

DESCRIPTION OF SAMPLES FROM TROXEL WELL NO. 2.

Rustler Springs, Culberson County, Texas. Located near the south line of Section 24, Block 110, Public School Lands, close to Troxel No. 1. Drilled in 1915. Descriptions by E. L. Porch, Jr., and J. A. Udden.

	Feet
Red sandy clay	85
Greenish gray clay and some red clay. Some fragments of gray, compact dolomite	150
Dark gray and brownish gray limestone of very compact texture. Gypsum, quartz grains, fragments of chert and other quartz, and pyrite noted	235
Gray dolomite of very fine texture. Pyrite, gypsum, rounded clear quartz grains and quartz crystals noted	240

*Am. Jour. Sci., Vol. XL, August, 1915. The Age of the Castile Gypsum and the Rustler Springs Formation, by J. A. Udden.

	Feet
Dark gray dolomite of fine texture. Effervescence in acid is extremely slow. With this is some marl. Fragments of gypsum, many. There are some rounded grains of quartz and some quartz crystals. Much pyrite. No bituminous fumes noted....	250
Gray and brownish gray dolomite of fine texture. Considerable pyrite noted. Many rounded sand grains of clear quartz noted. There are also crystals of quartz. Label says: "Bottom of lime".....	250
White gypsum, of moderately coarse crystalline texture. The sample contains some double pyramidal crystals of quartz, the largest 0.75 mm. in length.....	255
Mostly gypsum, with some anhydrite, white and gray, mostly moderately coarsely crystalline.....	350
Mostly gray and brownish dark gray dolomite of fine compact texture. In thin section it is seen to contain some anhydrite and is impregnated with pyrite, which occurs in exceedingly fine particles. The sample contains coarse rounded quartz sand and fragments of quartz pebbles. Much anhydrite present.....	405
Compact gray dolomite and white anhydrite. Bright yellow pyrite noted	450
Anyhdrite and gray compact dolomite. Bright yellow pyrite and fragments of quartz noted.....	500
White and gray anhydrite.....	515
White anhydrite, with some rounded quartz sand grains. Pyrite noted	540
White anhydrite	545
White and gray anhydrite, some quartz sand, fragments of gray flint, crystals of gypsum, and pyrite.....550-555	
Anhydrite with some sand, some pyrite, and considerable chert, which seems to have been in the form of pebbles. Most of the chert is dark.....555-560	
White anhydrite. Some flint present.....	600
White and gray anhydrite. Some quartz, some pyrite, and some flint present	625
White anhydrite, with a few particles of calcareous material.....	630
Gray dolomitic limestone containing pyrite, anhydrite and sand...	630
Light gray dolomitic limestone containing anhydrite, pyrite and sand. Another sample consists of anhydrite.....	650
Light gray anhydrite containing sand, pyrite, and a black mineral. Gave off a faint odor of bitumen when heated. An Endothyra was noted	680
Anhydrite containing a little sand.....	715
Anhydrite containing considerable calcareous material and some sand. On heating, a faint odor of bitumen was given off and a little sulphur deposited in the tube. Label says: "Gas".....	735

	Feet
Gray sandy limestone containing pyrite, fragments of pebbles of gray and dark chert, and gypsum. Endothyra noted. Gave off the odor of bitumen on heating	740
Gray limestone containing chert, anhydrite, sand and pyrites. On heating, gave off faint odor of bitumen, and a little sulphur was deposited in the tube. Endothyra and Textularia noted. Label says: "Some gas"	745
Gray limestone containing sand, most of which is below ⅛ mm. in diameter. Chert, anhydrite, and pyrite. On heating, a little oil distilled off	757
Light gray dolomitic limestone containing sand, fragments of chert pebbles, pyrite and anhydrite. Gave off odor of bitumen on being heated	795
Gray anhydrite, quartz sand, some calcareous material, and some dark chert grains	800
Anhydrite, white, gray and yellow	810
Anhydrite, and very dark limestone	822
Mostly white and gray anhydrite. Some very dark limestone, some sand and some fragments of greenish shaly rock	828
Yellowish and dark limestone with sand and very fine gravel. Pyrite and anhydrite noted. Some foraminifera like a Textularia with perforate walls was observed, and an Anomalina, well preserved	837
Limestone and anhydrite, both in very dark and in very light gray shades. Some sand present. Foraminifera of the types of Globigerina and Textularia quite common	843
Dark gray and brown lime rock, some black chert, sand, and some anhydrite. Pyrite noted	843?
White and dark anhydrite and some limestone. Sand and pyrite noted. Textularia present	850
Anhydrite, mostly white, and some dolomite. Globigerina, Textularia and a foraminifer like Anomalina noted	857
Like the preceding. Pyrite noted	857
Light gray limestone containing chert, sand, pyrite and considerable anhydrite. Gave off the odor of bitumen on being heated. Endothyra noted. Label says: "Little gas and oil"	940-943
Anhydrite containing calcareous material and a little sand. Some sulphur was deposited in the tube on heating	1030
Light gray limestone containing anhydrite, and pyrite. Upon being heated, a little sulphur was deposited in the tube, and a faint odor of bitumen was given off. An Endothyra was noted. Label says: "Gas and little oil"	1152-1154
Gray dolomitic limestone containing considerable sand, most of which is below ⅛ mm. in diameter, and a black mineral, probably chert. Some oil was distilled off, on the material being heated	1449

Feet

Dark gray limestone containing anhydrite, pyrite, sand, and a black mineral, probably chert. Considerable oil was distilled off on heating the material.....1942

Gray cherty limestone containing sand and anhydrite. Some oil was distilled off on heating the material.....1956

Gray, argillaceous, dolomitic sandstone containing a considerable quantity of black mineral, probably chert. Most of the sand is below ⅛ mm. in size. Considerable oil was distilled off on heating the material.....1962

Gray, dolomitic limestone containing black fragments (probably carbonaceous material), pyrite, sand, chert and anhydrite. A little oil distilled off on heating.....1982

Gray sandy marl containing pyrite and a black mineral. Considerable oil was distilled off on heating.....1988

Gray limestone containing considerable chert and sand. Some oil distilled off on heating.....1994

Dolomitic limestone containing pyrite and a black mineral. Most of the sand is below ⅛ mm. in diameter. Gave off a little oil on heating 2006

Sandy dolomite containing pyrite. Considerable oil distilled off on heating.....2010

Sand and clay containing a black mineral, probably chert, a little pyrite, and very little calcareous material. Gave off considerable oil on heating. Most of the sand is below ⅛ mm. in diameter. An Endothyra(?) was noted.....2018

Brown limestone containing pyrite, anhydrite and sand. Some sulphur was deposited in the tube upon heating.....2028

Brown limestone, containing some considerable sand, most of it below ⅛ mm. in diameter, and a little chert. On heating, it gave off the odor of bitumen. An Endothyra(?) was noted....2035

Argillaceous dolomitic sandstone containing anhydrite and pyrite. The majority of the sand grains are smaller than ⅛ mm. Some oil was distilled off on heating.....2041

Gray, argillaceous, dolomitic sandstone, containing a black mineral, probably chert. Some oil was given off on heating.....2045

Gray, sandy, dolomitic limestone, containing a little anhydrite, pyrite and bitumen. A little oil was distilled off on heating. Water at 2045 feet.....2052

Gray, calcareous sandstone containing chert, pyrites, and a green mineral. Most of the sand is below ⅛ mm. Endothyra was noted. Some oil was distilled off on heating.....2066

Gray, sandy dolomitic limestone containing pyrite, chert, and a little anhydrite. Gave off odor of bitumen on heating..... 2138

Gray, sandy limestone. Most of the sand is below ⅛ mm. Some oil distilled off on heating.....2190

	Feet
Blue-gray, sandy, dolomitic limestone; a little oil distilled off on heating	2197
Gray limestone containing some sand, most of which is below ⅛ mm. in diameter. Some oil was distilled on heating	2204
Gray, sandy, dolomitic limestone containing a little chert(?). Gave off a slight odor of bitumen on heating	2230
Gray, dolomitic limestone containing considerable sand, most of which is below ⅛ mm. in diameter, and a black mineral, fragmentary	2236

The deepest exploration in the region is the Huling-Ross Well No. 1 on the west half of Section 16, Block 59, in Reeves County. This extends to a depth of 4100 feet. In this boring, shale, gypsum, sand, some limestone, and red clay are reported from the uppermost thousand feet, and gypsum, "red beds" and sand are reported for the next thousand feet. The beds below this are known from samples and their character has been summarized as below:*

"Twenty-three samples representing the rocks penetrated from 2000 to 3000 feet below the surface, consist of anhydrite, in the main, intimately associated with more or less dolomite, and having mostly a thinly laminated structure, such as is seen in parts of the Guadalupian formation. Some fragments showed that this rock has in places been brecciated.

"At 2700 feet there is some nearly pure dolomite. Near 2800 feet there is a gray limestone containing some foraminifera and fragments of small shells and other fossils. In this part of the section the rock is otherwise uniform in character. Below this depth the samples from 3050 to 4115 feet consist of a rock which may be described as dolomite containing more or less fine sand, silt and clayey material. The range of variation in the composition of this rock is from nearly pure dolomite, containing only a small amount of siliceous material, to pure sand, as at 3100, 3150, 3400, and 3500 feet below the surface. At various depths, this rock has been impregnated with much bituminous material, so as to be black. Much of the other sandy dolomite is to a less degree impregnated with hydrocarbons, so that nearly all the samples from this part of the well will yield bituminous fumes and even drops of oil when heated in a closed tube.

"A mixed sample of this black rock taken from five different

*Bulletin of the University of Texas, Bureau of Economic Geology and Technology, No. 17, March 20, 1915. Potash in the Texas Permian, by J. A. Udden, pp. 46, 47.

depths was distilled to determine the hydrocarbon content. It was found to contain 14.2 per cent. of volatile combustible hydrocarbons. This includes an amount of oil equivalent to 2.4 gallons per ton of the rock."

The lower part of this boring undoubtedly extends a considerable distance into the Delaware formation.

The Delaware Formation.

The age of the Delaware Mountain beds is known to be lower and upper Permo-Carboniferous. They were not examined in any great detail for this investigation, just enough work having been done to try to determine, if possible, their relation to the overlying gypsum beds. The area examined lies just north and south of the Delaware Creek. As seen here, the beds are predominantly sandstone, usually somewhat calcareous. Near the top there are occasional layers of shales and limestones, some of the shale being very much indurated and highly carbonaceous.

From the Delaware Mountains to the gypsum plains, the country is gently rolling, with many hills scattered here and there, some of them flat-topped, due to a capping of limestone, or perhaps exhibiting what appears to be the typical form of erosion hills of the Delaware Formation where a hard capping is lacking: fairly well-rounded hills with steep sides, with occasional vertical cliffs where more massive or more resistant beds happen to be. Some of the hills are fair examples of wind-carving.

At a point some one mile east of Delaware Springs, a cliff on the Delaware Creek, nearly a hundred feet high, shows what is either the topmost beds of the Delaware or the lowest beds of the Castile Formation. Plate 8a. There are about twenty feet of thin-banded bituminous limestone, cavernous in places. Below this, down to a few feet above the water level, there are alternating beds of impure limestone and shale, some of the shales about in the middle of the section being somewhat purplish red in color. As a rule, the shaly layers have resisted erosion less than the limestone and are cut in deeper than this, leaving the top layers as an overhanging cliff in places.

A yellowish, rather fine-grained, sandstone begins a few feet

above the water level. This is like a great part of the sandstone noted in the Delaware. This sandstone, traced up the river, varies from thin-bedded to massive, and is characterized by many nodules. These were originally pyrite, but are now weathered, where exposed, to limonite, although usually showing some pyrite in the center when broken into.

In December, 1916, the uppermost flowing water in the Delaware Creek was a small sulphur spring about one mile east of where the country road crosses the river. This water contains sulphur in a finely divided state, and issues at or near the contact between a dark blue indurated carbonaceous shale and an overlying sandstone. Several hundred feet of this formation occur in the lower part of Troxel's well No. 2.

From the exposures seen it was impossible to tell positively whether the Castile Formation lies conformably or unconformably on the Delaware, but they appear conformable. Geo. B. Richardson thinks that the two formations are unconformable.*

Castile Formation.

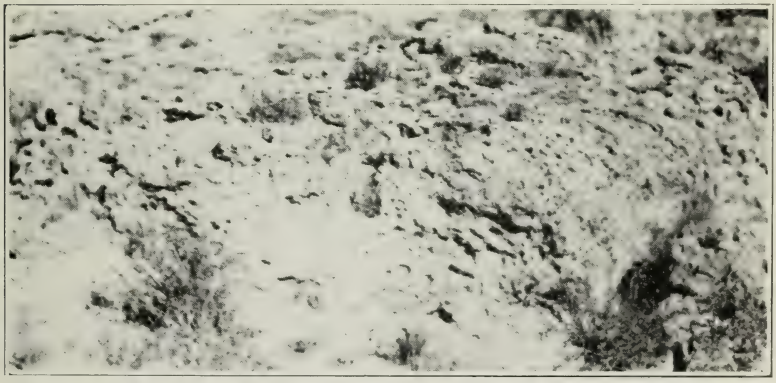
Although the greater part of it is covered with gypsite or gypsiferous soil, this formation as exposed may be roughly divided into two belts, an eastern and a western. The western belt is characterized by thin-banded gypsum, folded and contorted, and by gypsum hills, capped by more resistant layers of finely laminated bituminous limestone. These hills sometimes contain a limestone core.** White massive gypsum also occurs here. The eastern section is characterized by massive beds of white gypsum, while some of the "red beds" exposed east of the Rustler Hills may probably be included here, as in places there is typical Castile both below and above them. The Castile Formation probably reaches a thickness of approximately 2000 feet in the Huling-Ross Well No. 1, while in the Troxel Well No. 2 the thickness is probably between 1500 and 1800 feet.

In exposures, the gypsum is very cavernous, and it is impos-

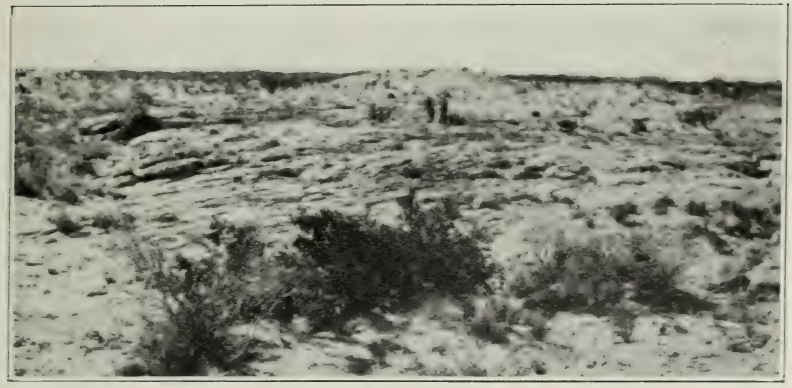
*The University of Texas Mineral Survey, Bulletin No. 9, November, 1904; Report of a Reconnaissance in Trans-Pecos Texas, north of the Texas and Pacific Railway, by G. B. Richardson; page 43.

**See description of the Grant Property.

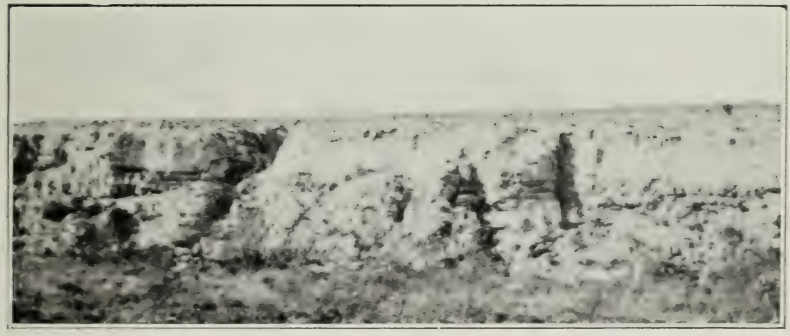
a. Maverick Springs, looking northeast. Erosion extending into the Castile Formation. Red bed materials show on both sides of this draw, the small hill in the foreground being partly composed of this material.



b. Characteristically weathered and cavernous dolomite (Rustler?) in the Virginia Draw near the Dot Prospect. The hill in the background is covered with gypsite.



a. Dip of the bed rock (limestone or limy dolomite) in the Virginia Draw, near the Dot Prospect. Bank above capped by gypsite. Looking west. Rustler hills in the distance.



b. Gypsum beds changing upward into gypsite in the Virginia Draw near the Dot Prospect. The gypsum beds are very much broken up.

sible to work out any real structure in it. In places, it looks as if it had been derived from limestone. Some sulphur occurs in the solid gypsum, but it has not been found in any considerable quantity, the most sulphur being in material of a later age.

Rustler Formation.

The Rustler Hills in this area run practically from north to south, and form a wide and low dissected ridge, being cut through by many draws, running both east-west and north-south. These leave a number of isolated hills and ridges by reason of having cut down through the Rustler to the underlying gypsum. The greatest aggregate width of the exposed belt of the Rustler Formation is some seven or eight miles.

The greatest thickness of this formation appears to be less than 250 feet. It consists typically of a brown gray dolomite or dolomitic limestone, containing, as seen at the extreme eastern and western exposures, east and west of the Michigan property, small white, button-like, calcareous nodules or inclusions, and a peculiar circular pitting, very uniform, the small holes sometimes being filled with calcareous material. On the hills overlooking the Michigan property, there were noticed many weathered blocks of what was apparently ordinary dolomite, yet seeming to contain a large number of angular fragments or dolomitic breccias. East of Troxel's well, this formation contains some beds of sandstone and conglomerate, and also of pink dolomite. The pebbles of the conglomerate are largely composed of flint, although an occasional one of dolomite may be seen. In places, however, there is considerable dolomitic conglomerate. The flint pebbles appear identical with those now so wide-spread over this district, and it is very likely that these are derived from former extensions of the Rustler, both east and west, which have long since been removed.

The Rustler in places is quite badly broken down, probably due to the slumping of the gypsum beneath.

On the eastern side, in an area of about one square mile, dips were noticed varying from southeast to northwest, the general direction of the dips appearing to be to the northeast. In a distance of about one thousand feet east of Troxel's well, start-

ing near the well, dips having the following directions were noted: east, south, west(?), east, almost south, and west (quite persistent), the last three occurring very close together. West of the well about five hundred feet there is a strong dip to the west. The Rustler is very thin at this point.

From a study of the alternating beds in the logs of the two deep wells drilled in this district, it is believed that this formation may be a large lens, in and near the top of the Castile Gypsum, from which the overlying gypsum has been removed by erosion.

Red Beds.

Besides those beds described near Maverick Springs, some of which are in the gypsum, and some of possibly later origin, there is a patch of "red bed" material near the Toyah-Michigan road about twenty-seven miles from Toyah. It is not known just where this belongs, stratigraphically.

Cretaceous.

There are no known beds of this age in the immediate vicinity of the sulphur deposits, in Culberson County, unless it be some of the conglomerates. Beds of this age occur just east of Cottonwood Draw and near the Huling-Ross deep well. Several Comanchean grypheas were found in a conglomerate about two miles northeast of Toyah, showing the proximity of the Comanchean at the time this conglomerate was made.

Quarternary.

To this age belongs most of the surface covering east of the Rustler Hills, and probably most of the gypsite west of them. This is a gypsiferous material, resulting from the disintegration of the original formation. Within the area covered, these deposits consist of the gypsite mentioned, conglomeratic material containing flint pebbles, clays, sands and some caliche. The flint and the dolomitic conglomerates may belong here or they may be older. The same may be said with regard to most

of the sulphur, for although some of this does occur in the unaltered gypsum, it is present as a secondary ingredient. Most of it occurs in the altered and younger deposits.

Both east and west of the Rustler Hills, there are many flint pebbles mixed with the soil, plentiful enough in places to form local conglomerates. Some pebbles of volcanic material were noticed a few miles east of the Rustler Hills, but none was noticed west of them. These pebbles were probably derived from the Davis Mountains.

A patch of stream bed or river conglomerate occurs in the bed of the Delaware Creek and in the small branches running into this stream, about four miles east of Delaware Spring. This persists for about a quarter of a mile, and is probably recent in origin. It shows the characteristics of a river conglomerate, being very irregularly bedded, with lenses of poorly consolidated sand. It appears to be fairly resistant, and is being cut into by the Delaware Creek. In one place a mushroom-shaped rock was noticed. This conglomerate consists mainly of rounded pebbles of dark blue, fine-grained, hard, thin-bedded limestone or dolomitic limestone, and consolidated sand, the cementing material being largely calcareous. Both pebbles and sand appear to be derived from the Delaware Mountain formation. One piece of the blue limestone noted had a cup coral, and another piece contained many Fusulina elongata(?).

DESCRIPTIONS OF SULPHUR DEPOSITS.

Sulphur occurs in a number of localities in an oval area extending from northwest to southeast, as indicated on Plate 9. This area has a length of about 46 miles and a width of about 22 miles. The bedrock consists largely of the Castile gypsum formation. In the southeast end some of the Comanchean outcrops are seen in close proximity to, if not directly underlying, the sulphur.

The larger part of the time spent in the field was given to a close examination of the individual sulphur deposits so far known from explorations which have been made at different times during the last thirty years. I shall here present descriptions of these occurrences, beginning with the localities farthest southeast and proceeding northwestward.

*Pit in Center of Section 34, Block 70.**

This pit shows dark colored, porous and cavernous, soft rock, containing much finely crystallized selenite and a fair sprinkling of minutely crystallized sulphur deposited with the selenite. The material in the pit had a distinct disagreeable odor, suggesting gaseous emanations.

*Pit in Southeast Corner of Section 13, Block 70.**

An eight-foot pit, showing one and a half feet of surface soil; below this a pure white clay like deposit containing considerable gypsum, stained red with iron in the bottom of the pit. On analysis this white clay-like substance showed considerable sulphur. (See p. 61 below.)

The Johnson Prospect.

This prospect represents, so far as is known, the eastern limit of the sulphur deposits. It is located in Section 8, Block 59, Reeves County, and is about one and one-half miles northwest

*Information on these two locations was furnished by Dr. J. A. Udden.

of the Huling-Ross deep well. There are a number of wells, drilled for oil, on the east, southeast, and south of this property at distances varying from one-third to three-quarters of a mile. Several of these, shallow wells, have produced small quantities of a heavy oil. Oil is standing about thirty-five feet below the surface in two of these shallow wells located in the southwest corner of Section 9.

Recent deposits resembling those found as a veneer over the Toyah basin, cover the surface in this vicinity. They consist of gravel, sand, gypsum, caliche and clay. The sulphur deposit is located in a depression, and the sulphur shows at the surface in many places. Two pits, each about ten feet deep, were put down on this property about a year and a half ago. At present, there are several feet of water standing in these pits, through which considerable gas is bubbling. Little craters, perhaps a quarter inch in diameter, through which gas has bubbled, were noted near one of the pits, and around these craters, thin layers of greenish-yellow substance, perhaps alum, had been formed. Fragments of brittle blue flint are present in some abundance.

The sulphur has been deposited, along with considerable selenite, in small cavities and cracks. There are to be found several varieties of sulphur, such as a yellow variety, both amorphous and crystalline; an amorphous variety, at times showing concentric banded structure as if it had grown around a nucleus; and also a drab brown, irregularly thin-banded clay-like sulphur, which is quite lustrous, when it is evenly cut.

The containing rock is gypsum, containing silica. Some of this may have originally been limestone, now altered to gypsum by the action of sulphuric acid. In fact, the blue flint present may be the only part of the rock not affected by the acid.

The Kyle Prospect.

This property and the vicinity adjacent thereto represents the most northeasterly occurrence of sulphur in the district thus far exploited. An area here is bounded on three sides by the Maverick, Virginia, and Salt Draws, and is elevated enough above the beds of these draws to be locally termed a "dome", although it is likely that this so-called structure is merely due

to erosional effects and slumping, rather than to tectonic forces. The Kyle is at the north end of this elevation, and is located in the northeast corner of Section 18, Block 45. It is about fifteen miles from Orla, and about thirty-five miles from Toyah.

Around the Kyle, the surface is covered with alluvial gypsiferous soil or gypsite, with here and there a patch composed of fragments of the Rustler Formation, until about a mile west where the Rustler occurs in place. Red beds material in place, more or less mixed with the gypsiferous soil, occurs as bands from twenty to a hundred and twenty-five feet wide, following the drainage lines towards the draws, and seems to be wash material. Flint and quartz gravel is generally disseminated over the whole area, locally forming thin layers of conglomerate.

Red beds outcrop in the banks of the Maverick, Virginia, and Salt Draws, the thicknesses as exposed varying from 5 to 9 feet. They are composed of red sandstone and red clay, both containing white spots, disseminated throughout. These beds appear to be the uppermost part of the Castile gypsum. Their irregular nature is shown by the fact, communicated by Dr. Wm. B. Phillips, that a well drilled in the northeast corner of Section 1, Block 111, passed through forty-three and a half feet of white-spotted red sandstone, and after passing through 3 feet of massive white gypsum, under this, went 15 feet further in more red sandstone. The three feet of massive white gypsum passed through contained a little crystallized sulphur. At Maverick Springs in Maverick Draw, badland topography is exhibited within a limited area, the beds being composed here of fairly hard red clay, containing the characteristic white spotting.

On the east side of Virginia Draw, close to where it runs into Salt Draw, the section exposed from north to south shows the following beds: white Castile gypsum, dipping north; light gray massive limestone or dolomitic limestone, dipping east; gray gypsiferous sandstone, dipping south; and limestone or dolomitic limestone, dipping south. On the west side of the draw, there is an outcrop of white Castile gypsum, having a variable strike which is approximately N. 45° E., and a dip of about 20°, more or less, to the northwest. There is a little red beds material on top of this gypsum.

The dips and strikes noted above seem to indicate that they represent the flanks of a local dome. Considerable work has been done at the Kyle in the past, and at least two attempts were made to extract the sulphur from the rock. The remains of what was apparently a circular rock furnace, and a huge kettle with its accompanying steam boiler, are still to be seen. The work done here consists of an open cut, its greatest dimensions being about 200 feet in length by 100 feet in breadth, and 12 feet deep. There are also a number of scattered pits.

The main exposure of sulphur-bearing material is in the south-central part of the open cut, where a face about 8 feet high is exposed. This consists of siliceous, brown, porous, earthy, although quite compact, material, containing many pebbles, grading into a gray-brown conglomerate in the highest part of the face. The conglomerate is quite hard and consists of flint pebbles cemented by sulphur and siliceous material. Some of this is very rich. Small masses or boulders of gypsiferous material occur in the lower part of the exposure, no disseminated sulphur being noticed in these. Laterally, the brown earthy material, carrying sulphur, becomes in a short distance much lighter-colored; sulphur not showing in this part. Three kinds of sulphur were noted: a sulphur of a silvery or metallic lustre, filling minute fractures or seams in the brown earthy material; a massive yellow sulphur, sometimes the color of sphalerite, and resin-like when broken, filling small cavities both in the brown earthy material and in the conglomerate, as impregnations, sometimes appearing to cement the pebbles in the conglomerate, and as incrustations at times an inch or more thick; and a finely crystallized, lemon-yellow sulphur, crystallizing in any open space on the containing material or on the amorphous sulphur. This crystallized sulphur is quite generally distributed throughout the darker portions of a brown, porous, earthy material. The porous material, especially on being broken, gave off the odor of SO_2, very likely due to the oxidation of the sulphur by atmospheric oxygen.

Two of the shallow pits nearby showed a little weathered sulphur occurring in porous gypsiferous material or gypsite.

A pit put down by the West Texas Sulphur Company of Philadelphia, located about 200 yards northeast of the Kyle

open cut, showed some sulphur. The pit is 18 feet deep, and was sunk in decomposed gypsiferous material, gray brown to gray in color, and containing crystallized gypsum or selenite.

A white and blue chalky or talc-like material on the dump, apparently from near the bottom of the hole, contains a little greenish-yellow sulphur occurring in cracks with very finely crystallized selenite. Although this pit is located on an elevation there was some water standing in it.

It was reported that a good showing of sulphur was encountered at 26 feet in a nearby pit. Drillings near here are reported to have encounterd good showings of sulphur.

East of here on the west side of Maverick Springs, there is a salt seep that has been taken up as a sulphur claim. Incrustations of white to rusty brown colored salts are now being deposited. The odor of hydrogen sulphide is apparent, and the water blackens steel in a very short time. No sulphur was noticed, although it is possible that some may be deposited along with the salts mentioned above. The nearby banks are covered with crystals of selenite, probably deposited by the waters draining into the draw.

Open Cut on Section 14, Block 113.

Northwest of the Kyle property, about two miles, and on the north side of Salt Draw, there is an occurrence of sulphur in the form of bright yellow crystals associated with a small amount of selenite in massive gypsum. The quantity of sulphur appears to be very limited. Decomposed red beds material outcrops just north of here. A stream of water, running through this draw, has deposited a quantity of selenite crystals below a small waterfall.

The gypsum is cavernous and broken down on both sides of the draw but especially on the north side, where for long distances the gypsum is honey-combed on a large scale, some of the caverns being quite large and deep.

Prospecting on Section 13, Block 113.

Drilling for sulphur was being conducted here by some parties. It was reported that they also intended to drill on

Sections 14, 23, and 24, in the same block. Sulphur is reported as being on this section.

Block 112.

Samples have been examined of brown porous material containing considerable sulphur, reported to have come from near the Culberson-Reeves county line.

The Dot Prospect.

This property lies between the Kyle and the Michigan, and is in the southwest corner of Section 2 and the southeast corner of Section 3, Block 111. It is located about 17 miles from Orla, on the south side of Virginia Draw.

The formation here is quite similar to that around the Kyle, except that dolomite or dolomitic limestone and conglomerate are more abundant.

The Rustler formation is practically continuous up to a point southeast of here, and a heavy exposure was noticed about 1¼ miles east of here in the middle of Section 1, Block 111. This is a dense gray dolomitic limestone, pitted with very peculiar circular holes, very regular in outline, sometimes filled with soft white to light-gray calcareous material, perhaps standing out in the form of a button, and sometimes with calcite. The rusty-looking nodules of flint that are quite characteristic of the Rustler occur here. The beds dip west, just the opposite of the general dip of the main beds. This may be a natural dip with a syncline between this place and the Rustler Hills; it may be due to a fault, or to incipient faulting caused by the slumping of the gypsum beds beneath, or to the expansion caused by the hydration of anhydrite.

Several years ago some work was done at the Dot, and there are still to be seen several pits and cuts. One of the pits is 19 feet deep, and the material on the dump, apparently taken from the bottom of the pit, consists of badly decomposed gypsum, some of it iron-stained, containing some selenite and a little yellow sulphur. Nearby another small sulphur occurrence was

noted. Just southeast of the sulphur occurrences there outcrops in the gypsite a thin layer of dolomitic limestone, apparently dipping to the southeast.

Thin coatings of sulphur on gypsite or alluvial gypsum were noticed in two places in the Virginia Draw, just north of the Dot. Drillings near here are reported to have encountered good showings of sulphur.

Near here, in the same draw, there is what appears to be three sides of the remains of a dome composed of dolomitic limestone and some flint; dolomitic secondary conglomerate, with the thin layer noticed at the Dot, possibly representing the fourth side of the dome. The rock composing this dome consists largely of gray brown, much-pitted or cavernous limestone and dolomitic limestone, in places showing a network of apparently secondary material in the cavities. This appearance may have resulted from the partial dolomitization of the limestone or from the acid waters, as all of the drainage from the old Virginia runs this way; or probably from both these agencies. A similar material, less altered, shows what are apparently small cavities or cracks; due, perhaps, to the contraction incident to the dolomitization of the limestone. Some of the very cavernous rock is evidently secondary, as many quartz and flint pebbles are contained in it. Small green streaks are also noticeable. These appear to be due to algae as the coloring material floats off when the underlying calcium carbonate is dissolved out by dilute acid. Minute growing mossy bands were also noted, clearly of vegetable origin. These may have influenced the deposition of the calcium carbonate over them. A short distance to the west these beds become quite thin-bedded and flaggy and soon plunge under the overlying formation. In places the limestone is crossed by small, nearly parallel fissures filled with banded gypsum, their strike being about N. 30° W. The gypsum beds in the draw north of here are dipping to the northwest. On the east the sides of Virginia Draw consist of steep cliffs, especially on the north side, composed of cavernous broken down gypsum layers, and alluvial gypsum or gypsite. About one mile east of the Dot, red beds make their appearance on both sides of the Draw.

In the area under consideration there are many small caverns or sink holes in the gypsum, caused by solution.

The Spann-Felch Holdings.

The east half, eighty acres, of the old Virginia (Cedars of Virginia) property is owned by Dallas people. It adjoins the Michigan Sulphur and Oil Company's property and lies in the northeast part of Section 16, Block 111. There are no outcrops here, the surface being quite level and entirely covered with a mantle of gypsiferous soil. The property is a half mile long by a quarter of a mile wide, and prospecting has been done by means of pits, seven to thirty feet deep, which are fairly well spaced. Their distances from the west line vary from one hundred to seven hundred and thirty feet, and from the north line, from three hundred to sixteen hundred and forty feet. All measurements were furnished by Mr. F. W. Felch. There are fourteen of these pits, and sulphur is reported to have been found in all, except one which was not very deep. A fair sulphur showing was also struck at a depth of about 3½ feet in digging a camp cellar. Several of these pits were examined and may be described as follows:

Pit No. 6, 119½ feet from the west line and 521 feet from the north line, is 14 feet deep and shows brown friable gypsite containing small selenite crystals. Most of it is conglomeratic, containing flint pebbles and altered pebbles and boulders. Some disseminated sulphur occurs in a two-foot band near the bottom. It occurs in an altered, porous, conglomeratic material, containing much crystallized gypsum.

Pit No. 7, 210 feet from the west line, and 520 feet from the north line, is 10 feet deep. The first three feet from the top consist of gray brown gypsiferous earth and very porous gravelly gypsum. Below this is gray brown conglomeratic material containing flint pebbles and pebbles and boulders of limestone altered to soft gypsite, up to several inches in diameter. This conglomerate is similar to that seen in Pit No. 6, except that the conglomerate becomes dolomitic about two feet above the bottom of the pit. At the bottom there is a black material containing altered conglomerate in places, and this shows some

good sulphur. Sulphur also occurs in the gypsum just above, which is porous and altered, containing much crystallized gypsum.

Pit No. 14, 695 feet from the north line, is 7½ feet deep. The distance from the west line was not ascertained. Sulphur was struck at a depth of four feet and continued to the bottom. The top foot and a half consists of brown gypsiferous soil with white-gray patches, containing some pebbles. From here down, there was brown gray, altered gypsiferous material, conglomeratic with altered pebbles and flint, and containing considerable crystallized gypsum. The sulphur occurs as incrustations and crystals in cavities and crevices, and sometimes around the altered pebbles.

Pit No. 5, 100 feet from the west line, and 770 feet from the north line, is 30 feet deep. This pit showed the following from above downward: Top 8 feet, gypsiferous soil; from 8 to 13 feet below the surface, sulphur carrying rock, containing incrustations and crystals of greenish-yellow sulphur, the lower part of which is quite dark, probably due to the presence of organic matter, and also containing many altered pebbles and considerable crystallized gypsum; from 13 to 16 feet, conglomerate; 19 to 20 feet, conglomerate; 20 to 23 feet, earthy clay-like material; 25 to 30 feet, dark gray dolomitic conglomerate, containing pebbles varying in size from ¼ inch to 6 inches in diameter.

Pit No. 3, 355 feet from the west line, and 752 feet from the north line, is 30 feet deep. Work was stopped when the hard dolomitic conglomerate was encountered. An examination of the dump of this pit showed the sulphur as yellow crystals and incrustations, occurring in gray, altered, gypsiferous material, containing small flint pebbles; and in a very dark altered material, apparently largely reworked. According to Mr. F. W. Felch, there are several feet of each of these sulphur-bearing rocks.

A flow of natural gas was encountered near the bottom of this pit (hydrogen sulphide was found in several of the other pits), in sufficient quantity to explode and burn a man as he was lighting fuses for blasting. This gas issues from a small crevice, and is now walled off and conducted through an open

pipe to the surface. Sometimes the gas, when lighted, burns with a flame several feet high, while at other times air is drawn into the pipe fast enough to emit a faint whistling sound. In the table below are given certain observations on the flow of gas in this crevice. These were taken in the hope of securing some definite information on the relation of the gas pressure to barometric conditions in the atmosphere.

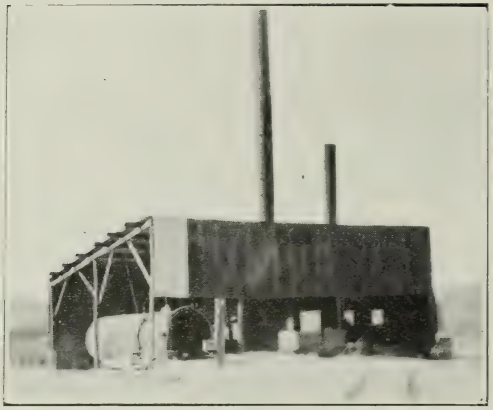
OBSERVATIONS ON FELCH'S GAS WELL, PIT NO. 3.

Date	Time	Barometer	Direction of wind	Flame
Nov. 28	7:10 p. m.	25.50	S. W. W. strong.	Violet blue with occasional tinges of red. About 4 ft. long.
28	9:10 p. m.	25.55	S. W. W. strong.	Extinguished.
29	9:00 a. m.	25.90	N. W. medium.	Sucks in with a whistling noise.
29	4:00 p. m.	25.90	N. mild.	Sucked in.
29	6:30 p. m.	25.90	Practically none.	Sucked in.
29	9:30 p. m.	25.90	Practically none.	Sucked in.
30	7:00 a. m.	25.84	W. very slight.	Sucked in.
30	12:00 m.	25.82	S. slight.	Not enough to burn steadily.
30	6:30 p. m.	25.70	S. W. light.	Violet blue flame, with a reddish tinge about 2 ft. long.
30	11:00 p. m.	25.69	S. W. slight.	Same.
Dec. 1	9:00 a. m.	25.65	S. W. W. light.	Burned with colorless flame.
1	2:30 p. m.	25.55	S. W. medium.	Burned with colorless flame.
1	6:00 p. m.	25.54	S. W. medium.	Same.
1	10:20 p. m.	25.55	S. W. slight.	Burns with a violet blue flame.
2	6:30 p. m.	25.55	S. W., about 6 miles.	Gas burning, 1 ft. blue flame.
2	8:30 p. m.	25.56	S. W., about 4 miles.	Gas out.
3	7:00 a. m.	25.53	S. W. light.	Gas burning, blue flame slight tinge of red, 6 inches.
3	7:45 a. m.	25.55	S. W. light.	Gas draws down.
3	7:30 p. m.	25.50	S. W. 4 miles.	Gas burning, 6 inch flame, blue, light tinge of red and yellow.
4	6:45 a. m.	25.50	S. W. strong.	Blue flame, 6 inches.
4	3:00 p. m.	25.51	S. W. medium.	Burns with a small roar.
4	6:45 p. m.	25.50	S. W. medium.	Wouldn't burn.
4	11:30 p. m.	25.51	W. medium.	Wouldn't burn.
5	2:00 p. m.	25.53	S. W.	Burned.
5	11:00 p. m.	25.51	Light.	Burned.
6	6:45 a. m.	25.43	Practically none.	Burned, strongly, blue and reddish flame.
7	6:30 a. m.	25.42	S. W. light.	Burned, 1 ft. flame.
8	7:15 p. m.	25.31	S. W. light.	Wouldn't burn.
9	9:00 p. m.	25.39	S. W. light.	Burning, 2 ft. flame, blue, showing of red.
10	8:00 a. m.	25.45	S. W., strong.	Wouldn't burn.
10	1:00 p. m.	25.53	S. W., high.	Gas draws down.
10	11:15 p. m.	25.60	W., very light.	Gas draws down.
11	12:20 p. m.	25.77	Almost W., medium	Wouldn't burn.
13	12:50 p. m.	25.44	N. E. almost E., light.	Burns.
13	2:00 p. m.			Wind reversed its direction almost 180°, and the gas still burned.
13	11:30 p. m.	25.40	Almost W., fairly strong.	Burning, blue, sometimes reddish.

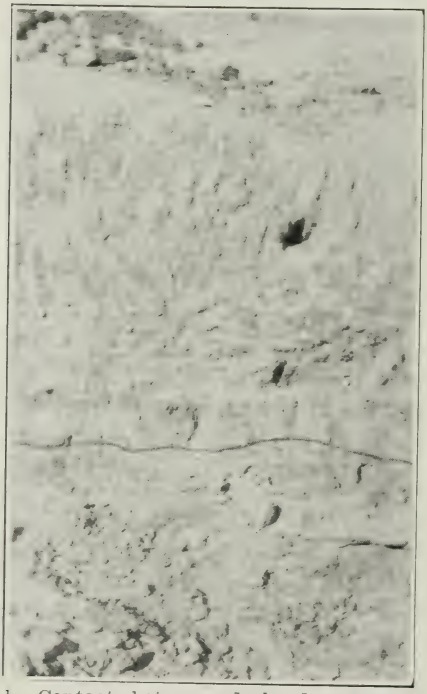
From these data it seems to me quite evident that the flow of gas is directly dependent on variations in barometric pressure. The highest barometric pressure recorded was on Novem-

ber 29th and 30th, and during these days there was a flow of air into the pipe from which the gas escaped. Immediately when the barometer began to fall, on the 30th, the flow of gas set in again. On the 1st, 2nd and 3rd of December, the atmospheric pressure was constant and low, and during this time the gas continued to flow. On the 6th the atmospheric pressure was falling and on that date the flow of gas was strong. On the 8th the pressure was the lowest recorded during the time of the observations, and we would naturally expect a flow, but it must be remembered that the pressure had been low during the two preceding days and much gas had then escaped. The failure of the flow on the 8th may readily be accounted for as the result of exhaustion of the supply, for the gas had been quite steadily flowing for the last week. It will also be noted that there was only one observation made at 7:15 p. m. and the absence of the gas flow may have been due to a sudden increase of pressure due to a surge of short duration at the time of observation. At any rate, on the following day there was a strong flow during quite low atmospheric pressure. The gas was again drawn down from 1 p. m. to 11:15 p. m. on the 10th, when pressure was relatively high, and rising. The supply of gas is evidently small and the pressure conditions between the gas below and the atmospheric pressure above are no doubt nicely adjusted. The small variations that seem difficult to account for on the basis of changing barometer no doubt could be readily accounted for, if we had full information with regard to underground conditions affecting the richness of the gaseous contents of the ground, and regarding the depth of the source of supply. It is certainly safe to infer that the underground supply is constant, whatever variation there may be in the flow.

A hole was drilled 1416 feet north of the northeast corner of this property on one of several other claims controlled by this same company. The summarized log of this boring was furnished me by Mr. F. W. Felch, and is as follows:



a. Steam plant for extracting sulphur. Rustler Hills in the background. Michigan Sulphur and Oil Co.



b. Contact between dark, decomposed, cavernous, gypsiferous sulphur-bearing material and the overlying gypsite, a short distance above line drawn to show flexure. Michigan Sulphur and Oil Co.

SUMMARY OF LOG OF HOLE NO. 1, DALLAS CLAIM NO. 2

	Depth			
	From		To	
Gray gypsum	0		4′	6″
Brown gypsum	4′	6″	15	7
Gray gypsum	15	7	16	1
Fine gravel	16	1	18	9
Light yellow gypsum	18	9	19	7
Dark yellow gypsum	19	7	20	8
Light yellow gypsum	20	8	26	1
Gray hard gypsum	26	1	33	8
Yellow gypsum(?)	33	8	38	6
Hard strata, one foot to 39′	38	6	40	4
Soft brown gypsum	40	4	41	3
Brown gypsum(?)	41	3	44	6
Sandy gypsum, smell of gas	44	6	45	10
Gray sandstone	45	10	48	
Yellow sandy gypsum(?), showing sulphur	48		50	6
Light yellow gray gypsum(?)	50	6	51	4
Gray gypsum(?)	51	4	56	
Light yellow gypsum(?) containing sulphur	56		57	

The bailings were run into a shallow pit, and allowed to settle and harden. A piece was then broken out and examined.

The Holdings and Works of the Michigan Sulphur and Oil Company.

This company owns the west half of the old Virginia property, 80 acres located in the northeast part of Section 16, Block 111. The holdings lie just east of the main Rustler Hills, and are situated in an indentation formed by the foothills of the Rustler and the main hills mentioned above; a considerable part of the foothills to the southeast being present only as isolated remnants of the ridge. The property is drained by the Virginia Draw, which runs to the northeast, uniting with the Salt Draw between the Dot and the Kyle properties.

A considerable amount of development work has been done, and sulphur is exposed in many places. Most of the work has been done in and around a depression in the central and southern part of the north forty acres. Development has been by means of open cuts, pits and shafts. It is reported that drillings on this property have encountered sulphur at greater depths than have been reached by the shafts. With th exception of several shafts, one of which attained a depth of 43 feet, and many shallow pits, the work has been concentrated in two areas. An open cut has been made in the northern part of the sunken area and several open cuts and drifts have been exca-

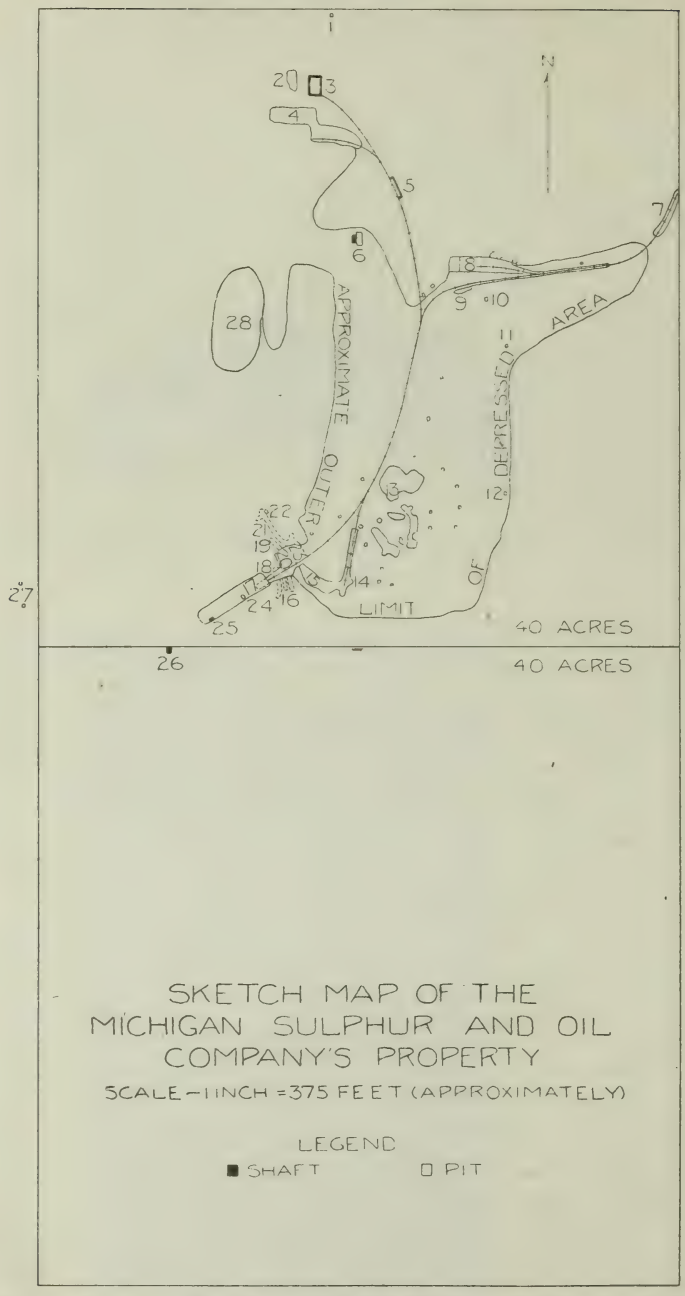


Figure 1.....Sketch map of the Michigan Sulphur and Oil Company's property.

vated in the southern and southwestern part of the same sunken area. This sunken area covers about 12 acres and drains to the northwest. Its surface is from 4 to 10 feet below the level of the surrounding country. It is covered with light gray gypsiferous soil containing many flint pebbles and it is barren of any plant life; whereas the surrounding area supports a scanty growth of yeso grass and a few junipers. Inflammable gas has been encountered in several of the workings.

The sulphur-bearing rock, as mined, is hauled to a loading platform, where it is loaded into special double-compartment, cast-iron cars having perforated sides and bottoms. Four of these cars at a time are run into the retort, which is then filled with steam at sixty pounds pressure. The retort consists of a horizontal iron cylinder, 30 feet long by 6 feet in diameter. One end of the cylinder is hinged, and the bottom slopes to a drain at the other end. The steam melts the sulphur from the rock and it drops through the perforations in the cars, flows down the inclined bottom to the drain, and out through the drain into a vat where it is allowed to harden. This steaming process takes some two and a half hours or more, depending upon the porosity of the sulphur-bearing rock. After a vat has become filled, the sulphur is broken into blocks. These have been stacked back of the retort house, and in December the pile was estimated to contain about two hundred and fifty tons of sulphur. Since then, forty tons of this has been shipped. It is reported that a second retort has been recently installed.

The accompanying sketch map shows the locations of the various cuts, pits and shafts.

Explanation of Numbers on Map.

(1) Pit about twenty-five feet deep, dump consists of gray gypsiferous earth containing no sulphur.
(2) Sulphur pile.
(3) Retort house, containing retort and two boilers.
(4) Dump for the steamed rock from the retort.
(5) Charging platform where cars are loaded before going into the retort.

(6) The deepest working on the property, and in fact, in the whole district; shaft about 18 by 12 feet, and 43 feet deep. From the bottom of the shaft shown in this sketch there are four drifts running approximately north 20 feet, east about 10 feet, south 50 feet, and to the west about 15 feet. The sulphur showing is continuous on various parts of the walls from top to bottom. The sulphur occurs as masses, incrustations, and disseminated crystals in the typical brown, porous, earthy material and altered black material. The black bands included in the brown material make many irregular bindings. The black material containing the most sulphur commences at about 20 feet below the surface. It is very cavernous and includes within itself small lenses of limestone or limy dolomite.

The black-banded condition extends to the end of the south drift, the sulphur content becoming less as the distance from the shaft increases. It extends also to the end of the north drift for a distance of at least twenty feet. The black-banded material pitches to the west under a mass of limestone or limy dolomite that appears just within the west drift. It continues also into the east drift. In places this black material is conglomeratic, and in other places is clay-like, some of it being quite white and plastic while moist; having an acid taste; but hardening after being exposed to the air for a few hours. The dump from this shaft contains much altered dark conglomeratic material.

(7) Dump for the steamed rock from the retort.

(8) Open cut, running east and west, and having a maximum depth of about 12 feet near the foot of a bench at the extreme western end of the cut, the bench being about six feet higher than the remainder of the cut.

Two drifts, working to the north, had just been started from the north side of the cut at the time of my visit, and the sulphur showing on both sides may be considered as commencing at the easternmost of these drifts, which was in only about 4 feet, and as continuing to the west end of the cut. Here the lower one and a half

feet consisted of a black and white mottled material, hard in places, in other places clay-like, cavernous, containing loose material in the seams, and also black secondary selenite. Sulphur occurs as incrustations in the cavities. The line of contact between this black material and the brown material occurring above is sharply marked, but is irregular. The brown layer persists upward for about four feet and then gradually merges into a gray gypsiferous earth, which persists to the surface. The brown material is conglomeratic, containing rounded pebbles of flint and black quartz. What was once pebbles and small boulders of dolomite or limestone is now altered, wholly or in part, to gypsite and gypsum. The physical characteristics of the brown layer are much the same as those of the darker layer below, for it contains inclusions of the dark material. The sulphur occurs in the same manner and much black gypsum is present; but it is not quite so cavernous.

The second drift, a few feet west of the one just described, shows similar conditions to exist, the main difference being that the line of demarcation between the black and brown layers is not so distinct, due to the fact that the brown material contains many more altered boulders and much more altered material, is more cavernous and fissured, and contains more sulphur than it did in the first drift. Incrustations of sulphur were noted occurring with clay-like material and in an altered pebble, probably once limestone. Between this drift and the bench, starting at the bottom of the cut, there is one foot of black material exposed. This contains considerable sulphur, both as disseminated crystals and as incrustations. The layer is somewhat conglomeratic, containing flint pebbles, and was apparently at one time much more conglomeratic, as the outlines of former limestone pebbles are still visible, now altered to a gray or black gypsiferous material. This layer can be traced around the face of the bench into the opposite south side at the bottom of the cut, where it is overlain by brown, porous, yet quite

hard, earthy and somewhat conglomeratic material, containing small quartz and flint pebbles, and, especially near the bottom of the cut, patches and small layers of very dark conglomerate, most of which is altered. Some of the pebbles have sulphur deposited within them. Both the dark altered conglomerate and the brown earthy material contain considerable sulphur, both crystalline and massive, generally disseminated throughout. Some of the crystalline sulphur is greenish-yellow. On the north side of the cut the line of contact between the layer of dark altered conglomerate and the layer of dolomitic conglomerate above it, which is absent on the south side of the cut just described, is quite irregular, and the sulphur content seems to increase near this contact.

This conglomerate varies in thickness from two to four feet, and consists of fairly well-rounded pebbles and boulders of brown, dark gray, and almost black dolomite, sometimes iron-stained, varying from one-eighth inch to five inches in diameter. The cementing material is very frequently calcareous. The conglomerate becomes thinner as the bench at the west end of the open cut is approached and contains very little sulphur. Above this there are two or three feet of black decomposed material, now more or less weathered and generally soft. The contact between this layer and the dolomitic conglomerate below is fairly well marked, but is very irregular. It is very cavernous, and contains considerable sulphur in leached out parts and cavities. The line of demarcation between this layer, which lies about five feet below the surface, and the top, light brown, gypsiferous soil is also fairly well marked, but irregular. Portions of the black material extend up several inches into the soil. The exposed face of the overlying soil shows here and there a thin incrustation of badly weathered sulphur, in places extending up to the surface. It also contains some sulphur near the contact with the black material. It is difficult to say just what is the chief cause or causes of the well defined yet wavy or irregular

contacts so characteristically shown in these excavations. They are evidently not due to folding. They are probably due to several causes combined. They may represent the upper limit of the strongest action of ascending waters, or the lower limit of surface leaching. The darker, more altered part of the ground may have had a higher lime or dolomite content, and may have been, therefore, more subjected to alteration by gases and water solutions. Much lime is present over all of this district, not only in limestones and dolomites, but also in altered pebbles. This is true also of the cementing material in certain dolomite conglomerates and also of some calcareous tufa. The dolomite pebbles and boulders appear to have resisted alteration by hydrogen sulphide and sulphuric acid much more than those composed of limestone. Some parts of the conglomerate contain sulphur. In the parts where dolomite is the most persistent material, the sulphur content is smallest, in some cases not appearing at all. Yet in others, apparently (to the eye) just as closely cemented, the pebbles of the conglomerate have been considerably altered to dark gypsiferous material, and much sulphur may be present, generally between the pebbles and in joints. Sometimes in the outer edges of the pebbles themselves where much leaching has taken place, and even where sulphur is present in or around dolomitic parts, it displays a selective relation towards materials that have lent themselves more readily to some alteration. The dark organic material present may be the organic detritus from the altered limestone. On the north side above the bench, the line of contact between the brown soil and the dark layer lying beneath it is not so well marked as some of the other contacts, the brown and black materials grading up and down slightly. This condition continues until the end of the bench is reached. The dark layer in this distance is slightly rolling, rises about two feet, is cavernous and in some places has quite a rich sulphur content.

There is a seven-foot pit at the western end of the

bench and the conglomerate below the upper dark layer shows up for about two feet in the side of this pit. Here the dolomitic part was either altered, or has changed its character, for it contains altered pebbles and boulders. In fact, it seems to be identical in some respects to the dark altered conglomerate underlying the dolomite conglomerate at the foot of the bench. The conglomerate in the pit also carries considerable sulphur. Opposite this pit, on the south side, this same conglomerate approaches closer to the surface, and near its top is more or less mixed with the brown earthy material. This mixed material contains considerable sulphur in places, and also some very hard boulders or nuclei, which on being broken show much sulphur and metallic sulphides, probably pyrite.

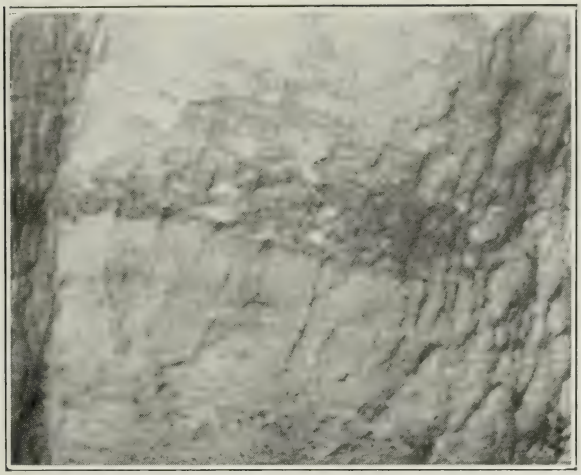
(9) Shallow open cut. The lower three feet consist of brown earthy, hard conglomerate containing some disseminated sulphur. The upper three feet consist of lighter brown gypsiferous earth and appear to contain no sulphur.

(10) and (11). Seven-foot pits, exposing gray-brown, gypsiferous, conglomeratic earth from the surface down to near the bottom, where there commences a black-gray, altered conglomerate carrying some sulphur, both crystallized and kaolin-like, and selenite.

(12) Seven-foot pit. Dumps show gray white, gypsiferous material, and some much altered conglomerate. It is badly weathered and was probably much darker when fresh. A little sulphur was noticed in the conglomeratic material.

(13) Here occurs by far the best sulphur exposure to be seen in this cut or in the three large irregular cuts immediately south of here, and this may be taken as a type for the rest. The one exception noted was the occurrence in one of the other three cuts referred to, of some sulphur in a more friable, white gray, decomposed gypsiferous earth.

Starting at the bottom of the cut there is from one to two feet of very rich sulphur-bearing material exposed, similar to the deposits occurring at 16. There is also



a. Entrance to the northeast drift at 16 in sketch map. Showing contact between the dark, gypsiferous material, and the brown, earthy material above. There is a great deal of kaolin-like sulphur in the dark material. A picked sample from the opposite side of this drift contained 54.4 per cent of free sulphur. Michigan Sulphur and Oil Co.

b. Part of the workings of the Michigan Sulphur and Oil Co. Looking north from the center of the south line of the north forty acres, near the south edge of the depressed area. Extraction plant in the left background. Photograph furnished by Mr. J. G. Townes.

disseminated crystallized sulphur, both in hard brown, gray, and black material, which is conglomeratic as at 8. The brown and black material is more mixed than usual, black masses occurring in the brown material. In fact, this deposit displays the characteristics of both 8 and 16. Some sulphur of a silvery lustre was also noticed from near here.

There are a number of pits, varying in depth from three to ten feet, scattered around these four cuts. Most of the deeper ones show a little sulphur in their dumps, which are badly weathered.

(14) Gray brown, gypsiferous earth, and a darker brown material are seen at this point. Three feet of the bottom ground contains considerable sulphur, disseminated and in seams, some of the seams being three-fourths of an inch thick.

(15) On the north side of this open cut, the upper five feet of the section exposed consist of brown, black-spotted, compact, earthy, gypsiferous material containing some sulphur quite generally disseminated, but sometimes more concentrated in places, and there are many crystals of selenite. The lower three feet consist of a mixed dark brown and black, gypsiferous material, apparently containing more sulphur than the brown material above, the general occurrence being much the same in both places.

The brown material is conglomeratic in places, containing pebbles of flint and quartz, and altered pebbles, which were probably once limestone. On the south side of this cut there is exposed much the same general condition of the brown and black material, although it is more altered than the material above. It contains many acicular crystals of selenite, and sulphur as disseminated crystals, in small masses, and some fibrous banded layers up to an inch and a half in thickness. The fibrous seams of the sulphur are at right angles to the general direction of the crevices or solution channels. These appear to pitch toward the south at about a sixty degree angle. This general condition persists on both sides of the cut west to the track, except that on the south side the black

material comes closer to the surface, about four feet of it being exposed. Here it has a banded and rolling appearance, and is cavernous.

(16) There are three drifts here under about an 8-foot capping. At the entrance of the one nearest to 15 there is exposed a 4-foot layer of the black material with a well marked, although irregular, contact with the hard, brown, porous material above. At the back of the drift this thickness decreases to about two feet. Considerable selenite is scattered throughout the ground. Much of the sulphur in the lower part of the black material is like kaolin in texture. It is present in well-defined, irregular or wavy, bands or layers. In places, some of these bands have a fracture at right angles to their longitudinal extent. Some bands are two or more inches in thickness. In the upper part of the black material, and in the lower two or three feet of the brown material, there are many cavities or open spaces, and many of these are lined with beautifully crystallized sulphur. Some of the crystallized sulphur is greenish-yellow. The upper part of the dark material is lighter than the lower part, and the sulphur in the brown material seems to show a preference for the browner, more altered, and more porous parts. The conditions outlined above hold true for the other two drifts. A white efflorescence of salt was noted on the brown and to a lesser extent on the black material at the back of the drift. This is most likely caused by surface seepage and evaporation.

(17) The physical conditions exposed here are much the same as those described under 16, except that the sulphur showing, which is quite rich there, gradually diminishes in this direction until very little is present here.

(18) A three-foot exposure of the black material is exposed here, the sulphur showing up well again. Otherwise, the ground is similar to that at 16 and 17. This continues around wherever the cut is exposed all the way to 19 and 20. The drift at 21 is on the contact between the black and brown material, which is almost directly over-

head practically up to 22, where the black condition either stops or swings out of the drift.

The brown material here displays the usual characteristics, but it has here much disseminated sulphur, and considerable banded sulphur, especially near the contact, where it is quite rich. Some distance before 22 is reached, sheets of the most beautifully crystallized emerald green sulphur start in and persist to 22.

(23) The brown material, with apparently a decreasing sulphur content, persists to here.

(24) Shallow pit. The dump shows a little sulphur in a dark, altered, gypsiferous deposit, containing selenite.

(25) Like 24.

(26) Shaft about 30 feet deep, containing several feet of water. Material on the dump shows sulphur occurring as layers, incrustations and seam fillings in white or gray friable material, and in the cavernous darker rock. The darker parts contain the greater part of the sulphur. Some of the cavities in the darker portions contain a thin lining that looks like wad.

(27) Two 10-foot pits, in white or gray friable, gypsiferous earth, containing a very little sulphur, apparently from near the surface.

(28) A low knoll or elevation, covered with fragments of Rustler dolomite.

The Georgetown Prospect.

This deposit is located on a hill in Section 10, Block 42, some two and a half miles southwest of Rustler Springs, and about one-half mile west of the main body of the Rustler Hills. Rustler dolomite or dolomitic limestone evidently once entirely covered this hill, as broken pieces are at present scattered all around. There are many small hills in this vicinity, at varying distances from the main Rustler Hills. Practically all of these hills exhibit the rounded appearance due to the presence of the limestone or dolomite. Evidently this has once been present and has been recently removed by erosion. Some of the gypsum in the hill may have originally been limestone, later altered by

sulphuric acid. The odor of hydrogen sulphide is quite perceptible.

The showing here is good, and six shallow pits and cuts contain sulphur, some of it quite rich. The pits are somewhat scattered, some of them being as much as 150 feet apart. The occurrence of sulphur here is quite typical, occurring in white to gray decomposed gypsum, which has the usual leached appearance. There is one showing near the top of the hill, the sulphur lying just under a ledge of harder material. The ledge in this case may have acted as a capping against which the sulphur was retained. A test of a recent Julus, incrusted with sulphur, was picked up in this immediate vicinity.

The Cooksey Prospect.

This property is west of the Rustler Hills and is located in Sections 10 and 15, Block 114. By automobile road to the Michigan it is distant from that property about 7 miles; and from Orla, about 25 miles.

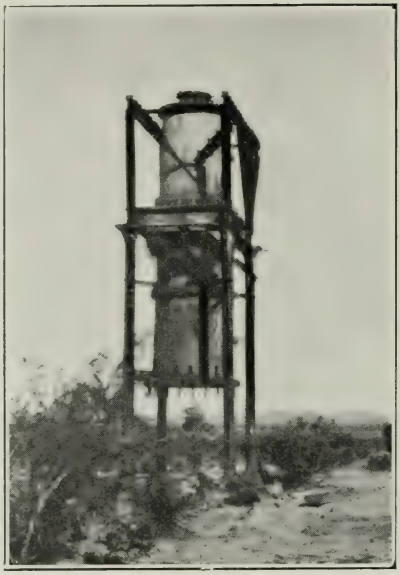
Hills capped with the Rustler formation extend to within a short distance of this place, and small hills covered with remnants of this rock extend some distance beyond. This, taken in connection with the abundance of dolomitic limestone or dolomitic pebbles present in the local conglomerates, shows that the Rustler dolomite or dolomitic limestone once covered this area, and has been removed by erosion.

This vicinity shows the same monotony of exposures as the area just east of the Rustler Hills, except that red bed materials are lacking. The surface around here is covered with alluvial gypsum or gypsite, with more or less frequent exposures of massive Castile gypsum and the patches of fragmental Rustler mentioned above. Flint pebbles are abundant and widespread. Gypsiferous conglomerates are quite abundant, the pebbles consisting chiefly of flint and dolomite or dolomitic limestone. A little sandstone is present at times.

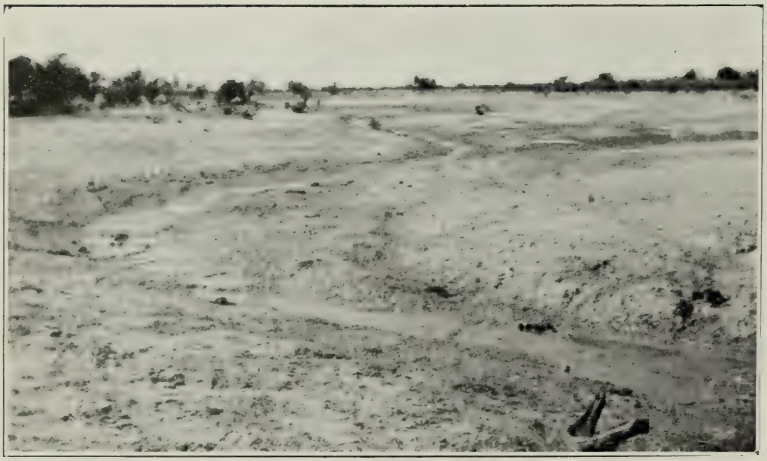
Considerable work has been done here and an old retort is still standing, minus the lower part used for extracting the sulphur from the rock with super-heated steam. It is said that about 75 tons of very pure sulphur were produced. Most of

a. Rustler Hills, looking south from about the center of the Michigan Sulphur and Oil Company's property. Gypsite covering in the foreground.

b. Best showing of sulphur on the Cooksey Prospect. Brown earthy siliceous material overlain by a thin capping of gypsite. A picked sample from here contained 41.8 per cent of free sulphur.



a. Furnace on the Cooksey Prospect. Said to have produced 75 tons of sulphur; built about 1900. The foundation of the furnace rests on Castile gypsum. Rustler Hills in the distance.



b. Stinking Seep. Looking to the northwest. A rusty brown incrustation now being deposited here on the gypsite contained 3.2 per cent of free sulphur. Typical Castile gypsum outcrops in the vicinity.

the work was done in an open cut, quite irregular in outlines, and running almost north and south; its greatest dimensions being approximately 200 feet in length, 80 feet in width, and 6 feet in depth. In this open cut there are several pits, cuts, and trenches. The best exposure of sulphur-bearing rock is in the extreme northeastern part of the workings and consists of a bank about 25 feet long and 5 or 6 feet high. The sulphur begins to show beneath about three feet of gypsiferous earth. It is brown, porous and earthy, but quite hard, highly siliceous material. In some places it shows a conglomeratic nature, flint pebbles predominating. The sulphur carrying rock has a maximum thickness of about 5 feet; the mineralization is not uniform, however, the upper two feet appearing to be the richest.

Sulphur is present as a variety having a silvery or metallic lustre, filling small cracks and fissures. It is in part banded. Yellow sulphur, exhibiting all shades from lemon to greenish yellow, is generally crystalline here, but also massive. It occurs along seams or in somewhat porous places, and very frequently crystallizes on the silvery sulphur, showing that it is a later deposit. A nearby pit exhibited a gray gypsiferous and sandy conglomerate, containing pebbles of flint up to ¼ inch in diameter, and crystals of selenite. Towards the center of the open cut there are several pits. The greatest depth reached by these pits beneath the original surface is not much more than twelve feet. The section exposed by these pits consists chiefly of brown earthy material, quite hard in places, except in the lowest parts, where there is some irregularly black-banded, partly crystallized gypsiferous material, and conglomerate. Flint pebbles are plentiful in the conglomerate and it contains considerable sand. Some crystallized yellow and greenish yellow sulphur was present in the black-banded material.

About 200 feet southeast of here there is an exposure of what is apparently a vein of secondary gypsum, containing a little crystallized sulphur in crevices.

The Stinking Seep Prospect.

Stinking Seep, sometimes called Chemical Springs, is probably located on Section 44, Block 60, about 3 miles northwest

of the Cooksey. It is a small spring highly charged with salts and hydrogen sulphide, and probably some sulphuric acid. Although the quantity of water that flows here to the southeast is not large, yet a considerable area is influenced by it, judging from the lack of vegetation in the immediate vicinity of the springs.

Considerable fine sand was noticed just east of the spring. An outcrop of white massive Castile gypsum occurs at the east end of the spring, the waters passing over it. Yellow incrustations occur in abundance over the whole area that has been worked over by the spring waters. Just north of the spring heavy beds of massive Castile gypsum outcrop in the form of low hills, capped with white to brown granular limestone, probably of secondary origin. Four shallow pits in this vicinity show a little sulphur. The sulphur occurs as crystals and incrustations in friable decomposed gypsum, in small white areas that have apparently been leached by water.

Deposits Near Walker's Ranch.

A six-foot pit located in the southeast corner of Section 4, Block 109, shows decomposed white grayish gypsum, at the surface, then typical brown, earthy, siliceous material to the bottom. Some small vertical seams of sulphur were noticed in the sides of the pit.

In the southern part of Section 4, Block 109, there is a six-foot pit situated in the midst of a large white, leached area, some hundred feet in diameter. This pit exposes in the order named typical gypsite at the surface, white to gray decomposed gypsum, then brown earthy material in one side, and more or less of the fine-banded gypsum. The banded gypsum contains in places fragments of thin-bedded, brown, bituminous limestone, smaller fragments of which are also scattered throughout the decomposed gypsum. A little sulphur was noticed in one corner of the pit. Considerable yellow sulphur, both crystallized and massive, is present throughout the small dump, from this pit, some fragments being quite rich. This is also the only place noted where sulphur occurs as a coating on the bituminous limestone. The limestone does not exhibit any

marked alternation and probably effected no selective action on the sulphur emanations, other than that it was the most convenient area for deposition.

There is a five foot pit about 150 feet northeast of the pit described above. The section exposed here is similar to the section exposed there, except that the thin-bedded bituminous limestone is lacking. Sulphur occurs in the banding in the badly decomposed white gypsiferous earth and in a brown earthy material. Besides the yellow sulphur, both crystalline and massive, a little silver sulphur was also noticed.

A fine showing of sulphur was noted in a three foot pit, which is probably in the southwest corner of Section 4, Block 109. The sulphur at this place occurs in gray brown gypsum, some of it apparently once banded, and also in brown, compact, earthy material. Massive banded sulphur, crystalline yellow sulphur, and massive silver sulphur are all present. There is more of the silver sulphur here than at any other place noticed. A somewhat concentric structure is developed in places in the banded yellow sulphur. A two foot assessment pit located fifteen feet northeast of here, shows the effects of water action, but no sulphur. Fifteen feet west of the three foot pit, good sulphur is present just below the surface.

On the southwest quarter of Section 9, Block 109, there is a good showing of sulphur on the south side, where some stripping has been done, and also on the top of one of the low gypsum hills, capped with limestone. These are characteristic of the western belt covered by the Castile gypsum. The limestone is quite similar to the capping at the Grant, a brown minutely banded, somewhat bituminous limestone, with layers, sometimes several inches thick, of hard, massive, dark brown and highly bituminous limestone.

The hill is badly broken down, and small blocks of the laminated rock are tilted at all angles to their original position. Both the yellow and silvery varieties of sulphur were noticed. The yellow sulphur occurs as incrustations or fillings, both crystalline and massive. A very little silvery sulphur occurs in small seams. In this hill the occurrence of the sulphur is invariably associated with white, decomposed patches of gypsiferous material appearing on the surface of the ground, which

look as if they might be leached by seepage. These patches vary from 20 to 50 feet in diameter, although they are not always circular in outline. The original banded layers can be traced grading into the white-gray, decomposed material. In some places harder layers have resisted erosion and form very small cliffs, from beneath which the water seems to have come, the hard layers perhaps preventing it from rising to the surface.

In the northeast corner of Section 10, Block 109, there is a seven foot pit showing a foot of white gray gypsite at the surface, and below this brown earthy material to the bottom. The lower two feet contain yellow sulphur, and yellowish green crystallized sulphur occurs in seams and open places. There are also streaks of silvery sulphur.

The dump consists of white gray gypsite containing selenite and considerable weathered yellow sulphur is present, some of it being more than an inch in thickness. This sulphur on the dump probably came from the very top of the pit. Gas was noticeable at all of the sulphur exposures in this vicinity, both H_2S and SO_2.

At all of these exposures there was a bare leached area around the sulphur, with the ground white to gray in color and slightly sunken, apparently due to the action of circulating or stagnant water. These shallow depressions are more or less circular or oval, from 20 to 100 feet in diameter, and are characterized by a lack of vegetation. Some of these depressions were noticed where there was, apparently, no sulphur at the surface.

Prospects On and Near the University Lands.

In the northeast part of Section 1, Block 46, and in Section 7, Block 115, there are sulphur occurrences located on the west side of a hill whose longer axis runs approximately from north to south. The hill is largely composed of fine-banded gypsum, covered in many places with white to gray gypsiferous earth. Selenite is abundant in the gypsum. One mass of selenite was several feet across. This was seen on the western edge of the hill. Several ravines have cut their trenches into the hill, their courses varying from northwest to southwest. The capping of

the hill consists of an altered limestone, quite cavernous and the crevices containing much stalactitic material.

The sulphur occurs around the western edge of the hill in white, more or less circular or oval, areas, sometimes seen to be depressed below the general surface of the land. These have perhaps been formed by the action of moving acid waters, either descending or ascending, which have decomposed and worked over the gypsum and limestone, in the immediate vicinity. The worked-over areas in this vicinity are small, generally not over 30 feet in diameter.

The sulphur occurs as thin incrustations in the banding of thin-bedded gypsum, and in cracks in the same rock. It is also present as a closely granular form in white or gray gypsiferous earth, which contains in places much selenite. In places, sulphur is present as massive incrustations on broken or exposed bedding planes and other surfaces. Straight bands of sulphur, slightly elevated above the surface of the more massive incrustations in some places tend to enclose diamond shaped cavities. These may have been formed by the solution of the gypsum, which was partly inclosed by the cracks filled with sulphur. Five claims have been filed on this land, covering all of the known sulphur exposures. There are five shallow cuts, two pits, and one pit and cut combined.

No sulphur was noticed in any of the pits below the upper two feet. Hydrogen sulphide was perceptible at all of the openings. Two of the pits contain standing water. On the edge of the pit in the combined pit and cut, in the inside wall of which a gypsum vein is discernible, there is a timber, probably placed in position during the progress of the work. This has been so completely attacked by acid fumes, that it is completely charred.

The Grant Mines Property and Vicinity.

There are three hills, all possibly the remains of a former hill, on the eastern section line of Section 18, Block 61, Township 2. These hills are interesting, not alone from the fact that there is a sulphur occurrence here, but also because of the structural relations shown. The three hills may be more properly re-

garded as two, and may be conveniently referred to as the east hill and the west hill, the west hill having two peaks with a saddle between them.

The lower part of the west hill is composed of thinly banded gray gypsum, the bands being from one-fifteenth of an inch to a half inch in thickness. Between the bands there is a thin layer or parting composed of dark brown bituminous calcareous material. These thin bands are complexly folded. The minute folds are sometimes not more than a quarter-inch from crest to crest. At times they flatten and give out both vertically and horizontally, and then commence again. An incline in the east side of this hill exposes about 40 feet of this gypsum, and it is quite uniform throughout. The only variation noticed was a variety having a little sulphur associated with selenite occurring as incrustations in minute fissures and along the banding. The main beds exposed are also folded, the folds being several feet wide from crest to crest. Both the minute and the more extensive folding may be due to the swelling accompanying the hydration of anhydrite, and its recrystallization into gypsum; or the finer folding may have been ripple marks originally, which have been later intensified and distorted by either the swelling incident to recrystallization or by pressure due to slumping. The larger folding may also have been caused by slumping. The very thin partings of bituminous limestone probably represent the deposition at times when the salinity of the water was diminished by overflows. Pl. 7.

The upper part and capping of this hill is composed of a weathered, cavernous, somewhat bituminous limestone, very minutely banded; the bands are much distorted and broken. About half way up this hill there is a thin layer, apparently less than two feet thick, of hard, thinly-bedded limestone. It is finely crystalline, dark brown, highly bituminous, and the layers average a half inch in thickness. It seems to be very little altered and is present on the sides of the east hill. Fragments of this limestone were traced from here south about a quarter of a mile, showing that it was formerly much more widely distributed.

The external characteristics of the east hill are much the same as those of the west hill, but here the resemblance ends. The

Banded gypsum at the entrance of the incline on the east side of the west hill. Grant Mines Property.

work that has been done on both the east and west sides of this hill tends to show that the hill has a limestone core and that solutions have been active in and around the outer layer of this core. An open cut starting at the west base of this hill and extending eastward, passes through the solid finely-banded gypsum, and into about five feet of gray brown, cavernous, crystallized gypsum. The contact between these two is vertical and is clearly defined. Next to the brown and cavernous crystalline gypsum, eastward, are about four feet of very fine, friable, white, siliceous material, containing some gypsum. Then there is about 15 feet of white, brown, and black-banded gypsum, and limestone containing patches of selenite. This gypsum is evidently altered limestone, for in places the two merge and it is impossible to see where the limestone stops and the gypsum begins. This grades into more solid black gray limestone, cavernous and decomposed in places. Small fillings and incrustations of sulphur were noted in places, and some sulphur dust (small fragments) was taken from a small cavity in the working face.

In thin section this limestone is seen to be composed of interlocking grains of calcite. It has the appearance of being considerably altered. It also contains bituminous material. From the top of this open cut, the rock has been stripped toward the summit for some distance. The limestone exposed here is very finely banded, minutely folded; it is gray brown from the bitumen it contains. Many minute cracks and fissures, especially along the bedding planes, were noted, quite a few of them being wholly or in part filled with secondary gypsum. A little sulphur was also frequently seen to be deposited on the secondary gypsum. These fissures and small caverns were possibly caused by the same solutions that were active in forming the altered material in the open cut below, for they become less pronounced as the distance from the outer edge increases. About two-thirds of the way up the hill and a short distance north of the open cut, there is an exposure of sulphur occurring in decomposed friable, brown gray or white, gypsiferous material. At this point considerable hydrogen sulphide is given off at times.

At about the same elevation and just south of the line of the open cut, there is a natural shaft-like opening, said to be 100

feet deep and to have been lined in places with sulphur, which has been removed during some work done several years ago. An incrustation of sulphur was noticed on the wall just above the mouth of the shaft. There was also a vertical gypsum vein, about four inches thick, in the south wall. It consists of decomposed earthy material. Sometimes the hydrogen sulphide issuing from this shaft is perceptible at a distance of fifty feet or more.

On the east side of this hill and about two-thirds up its side, stripping has uncovered a good showing of sulphur-bearing rock, for a distance of about 40 feet. This deposit, where exposed, has a thickness of about four feet, and certain parts of it are very rich. Directly in contact with the sulphur, the containing rock is white and altered, but a short distance away, where it has evidently not been altered, by the hydrogen sulphide, the limestone is practically identical with that occurring in the open cut on the west side.

A few feet below this sulphur exposure an open cut has gone in far enough to show that the limestone is very similar to that in the other open cut. But the mineralizing action has been less intense around the outer edge. A lump of sulphur was noticed from this cut, and in places the cavities in the rock were lined with petroliferous material.

Open Cut on Section 8, Block 61.

The thin-banded condition of the gypsum persists northwesterly from the Grant, and a little white massive gypsum appears here and there on the surface. This becomes more calcareous as the base of the gypsum is approached.

There are several hills northeast of the Grant that have a similar capping of weathered limestone. In fact, between the north and south limits covered, this capping seems to be quite typical for the western edge of the gypsum.

About one mile north of the Grant, and probably on the extreme western edge of Section 8, is a shallow pit, showing some yellow sulphur in loose, decomposed, white to gray gypsite or gypsiferous earth. The odor of hydrogen sulphide is readily perceptible at this locality.

Other Sulphur Locations Reported.

A number of other reported locations of sulphur were obtained from authentic sources. These are on Sections 9, 10, 11, 13 and 14, Block 111; Sections 5 and 24, Block 109; Sections 10, 11, 18, 19, 22, and 23, in Block 115; Sections 15 and 16, Block 60, Tsp. 2; Sections 16 and 17, Block 61, Tsp. 2; Sections 48, Block 62, Tsp. 1.

TYPES OF SULPHUR.

From the descriptions of the local deposits of sulphur occurring in this field, it will be seen that some distinctions can be made of different forms the sulphur deposits have assumed. We may group these into a few general types, which cannot, however, be said to be distinguishable in every case, but which merge very frequently into each other. A study of these types and their relation to the different kinds of matrix, or containing rock, is quite instructive and suggestive of the conditions under which mineralization has taken place. The most readily distinguishable types are as follows:

1...Yellow crystallized sulphur is very common; especially when it occurs in association with brown, porous, siliceous material, in which it is usually well disseminated. The common size of the crystals is from a pin point up to about one-eighth inch in diameter. Some of the crystals in the massive gypsum may become much larger than this size. The color varies from resin-yellow to greenish-yellow.

Occurrences of this type of sulphur were noted in the following locations: On Section 34, Block 70; Johnson; Kyle; Section 14, Block 113; Section 1, Block 111; Spann-Felch; Michigan; Georgetown; Cooksey; Stinking Seep; Section 4, Block 109; Section 9, Block 109; Grant.

2...Yellow massive sulphur is the most common variety of sulphur, forming the bulk of the deposits. It occurs in seams, layers and masses, ranging in thickness from that of a knife blade edge up to a foot or more. It sometimes exhibits banded or concentric layered structures, as if the layers had been deposited around a common center. The color varies from drab yellow and greenish yellow to very light yellow.

Occurrences were noted at the Johnson; Kyle; Dot; Spann-Felch; Michigan; Georgetown; Cooksey; Stinking Seep; Section 4, Block 109; Section 9, Block 109; Section 10, Block 109; Grant; Section 8, Block 61; University Lands.

3...Green crystallized sulphur occurs rather sparingly, the

Michigan being the only property where it was noted as occurring in any abundance. The size of the crystals noted ranged from almost microscopic size to about one-quarter of an inch in diameter. The color ranges from emerald green to yellowish green.

This variety of sulphur has probably been deposited both from gases and gases in solution in water. The green color is probably due to contained impurities, although it is possible that physical properties also affect the optical qualities of the sulphur.

Occurrences of this type of sulphur were noted at the Spann-Felch; Michigan; Cooksey; and Section 10, Block 109.

4...There is also a green massive variety of sulphur. Occurrences of this type are very rare, and form no appreciable portion of the deposits I have found. It occurs in thin layers, and is of a yellowish green color. This was noted at the Cooksey; Kyle; and Spann-Felch properties.

5...One variety of sulphur is silvery white and massive. This occurs frequently, but in small quantities. It occurs in some abundance near Walker's Ranch on Section 4, Block 109. It usually is found in minute seams, although in places masses several inches thick were noted. It was seen at the Johnson; Kyle; Michigan; Cooksey; Section 4, Block 109; Section 9, Block 109; Section 10, Block 109.

6...Last we can distinguish a cream-colored massive or kaolin-like sulphur. This occurs only rarely, but is present in some quantity at the Michigan. It there forms masses or layers up to several inches in thickness. This type was seen only at the Michigan and the Grant properties.

Kinds of Matrix Containing Sulphur.

The surface of this district may be said to be almost everywhere covered with gypsite or gypsiferous earth. This surface material in part represents the weathered remnant of the original sediments of gypsum, limestone, and dolomite or conglomerate, constituting the mantle rock and the bed rock of the region. In fact, in various places it can be traced, grading into

pure gypsum and limestone, and into brown earthy, siliceous material, evidently derived from the bedrock.

Gypsite consists of gray brown to dirty gray soil, usually unconsolidated at the surface, but fairly compact at a shallow depth. Flint pebbles are spread over practically the entire area, and locally there are layers of conglomerate consisting of flint or dolomite pebbles, or of the two combined. In places, considerable quantities of sulphur are contained in this superficial material, but it usually is not as rich in sulphur as the underlying materials to which it gives way when followed downward.

Over the entire district, with the possible exceptions of the extreme northwest and southeast extensions of the field, we find a *brown, siliceous material* underlying the gypsite veneer. By analysis this has been found to consist almost entirely of silica, but in places it contains also much selenite. It grades downward into a dark gypsiferous, cavernous and porous ground In places, these two materials are very much intermixed. This deeper-lying brown material is conglomeratic in places, with usually flint pebbles or pebbles which probably were originally limestone, but now consist of gypsum or even of siliceous material. This soft ground contains much sulphur, both massive and crystalline, the crystallized sulphur being usually well disseminated in all cavities.

A *dark ground* is present all over the district usually underlying the brown material. It possesses many characteristics in common with the brown ground, but it contains much more gypsum than the brown ground and it is less porous. It is typically a dark gray to black, compact earth, quite frequently porous, and even cavernous; containing an abundance of gypsum; both in the form of gypsite and selenite. It is very frequently conglomeratic, and contains beds or patches of dolomite and altered conglomerate, the altered pebbles probably having been limestone, now altered to gypsite. Much sulphur is present in this material, both massive and crystalline. More sulphur of massive texture occurs in this material than is found in the overlying brown ground. Crystallized sulphur is, as a rule, not so generally distributed in this ground.

Where the gypsum of the bed rock outcrops and has not been badly weathered, it consists of massive white alabaster. This holds true everywhere with the exception of the extreme western belt, where the gypsum is divided into thin layers by limy, bituminous partings. Both crystallized and massive sulphur occurs in this alabaster, but where seen, the occurrences were of no importance.

The accompanying table has been prepared to more clearly elucidate the relations noted in the distribution of different forms of sulphur to different types of rock and ground in which the sulphur is lodged.

TABLE SHOWING, IN NUMBER OF TIMES OBSERVED IN THE FIELD, THE FREQUENCY OF ASSOCIATION OF DIFFERENT TYPES OF SULPHUR WITH DIFFERENT KINDS OF MATRIX IN WHICH THE SULPHUR OCCURS.

Types of sulphur	Kinds of Matrix			
	Gypsite	Brown siliceous material	Dark gypsiferous, porous material	Massive gypsum
Yellow, crystallized sulphur	8	2	4	2
Yellow, massive sulphur	16	7	3	1
Green, crystallized sulphur		4	4	
Green, massive sulphur		2	1	
Silvery white, massive sulphur		7		
Cream white, massive sulphur			3	

Chemical Composition of the Sulphur and of Its Matrices.

Sulphur Analyses.

The amount of time available for field work in this district did not permit of a thorough sampling of the deposits. However, a number of samples were taken in order to obtain a general idea of how much sulphur the better grades of the material carried. The analyses of these samples for sulphur are given below. Three of the samples were tested qualitatively, for arsenic, with negative results. These analyses show variations between wide limits, and it is to be expected that the individual deposits will vary in the same manner. It seems that all of the localities contain some rich pockets.

ANALYSES OF SAMPLES OF MEDIUM AND HIGH GRADE SULPHUR ORE, FROM THE RUSTLER SPRINGS SULPHUR FIELD.

Analyses by J. E. Stullken.

Sample number	Sulphur* content in per cent	Arsenic (Qualitative test)
1	54.00	Not tested
2	40.50	Not tested
3	74.90	Not tested
4	15.80	Not tested
5	14.00	Not tested
6	43.70	Not tested
7	20.70	None
8	12.70	Not tested
9	54.40	None
10	10.10	Not tested
11	41.40	Not tested
12	36.80	Not tested
13	41.80	Not tested
14	30.10	Not tested
15	3.20	Not tested
16	90.40	Not tested
17	79.20	None
18	20.40	Not tested

*Sulphur extracted with carbon bisulphide.

LIST OF SAMPLES.

1. Picked sample of drab brown, irregularly thin-banded, clay-like sulphur from the Johnson Prospect.
2. Picked sample of brown, earthy material from the main exposure at the Kyle Prospect.
3. Picked sample of yellow conglomeratic material from the main exposure at the Kyle Prospect.
4. Black gypsiferous material from the dump at pit No. 5 on the Spann-Felch Holdings.
5. Dark gypsiferous conglomeratic material from beneath the hard conglomerate layer on the north side of 8 (see sketch map) Michigan Sulphur and Oil Company.
6. Picked sample of dark gypsiferous material from above the hard conglomerate layer mentioned under sample No. 5.
7. Mixed brown and black conglomeratic material from the southwest corner of 8 (see sketch map). Some of the black material contains metallic sulphides. From the Michigan Sulphur and Oil Company.
8. Altered conglomerate from the north side of locality 8, marked on sketch map of the Michigan Sulphur and Oil Company property.
9. Picked sample of black gypsiferous material from locality 16, marked on sketch map of Michigan Sulphur and Oil Company property. Contains cream-colored or kaolin-like and greenish yellow crystallized sulphur.
10. Brown earthy material overlying the material of sample No. 9.
11. Picked sample of brown earthy and black conglomeratic material from locality marked 13 on sketch map of Michigan Sulphur and Oil Company property.
12. Picked sample of gypsite from the Georgetown Prospect.
13. Picked sample of brown earthy siliceous material from the main exposure at the Cooksey Prospect.
14. Black banded gypsiferous material from the Cooksey Prospect.
15. Yellow incrustation now being deposited at Stinking Seep.
16. Picked sample of sulphur from near Walker's Ranch, probably in the southwest corner of Section 4, Block 109.
17. Sample of massive sulphur from the east side of the east hill, Grant Mines Property.
18. Sample of gypsite from the University lands.

Analyses were also made of several of the typical materials, with which the sulphur is associated. In the table below these analyses are brought together to facilitate comparison. These analyses show that the various deposits exerting, possibly, a se-

lective action on the deposition of sulphur, may be roughly divided into three classes; siliceous deposits, gypsiferous deposits, and deposits containing much bauxite. However, no hard and fast line can be drawn between the three classes. They grade one into the other. This is to be expected, as their composition depends both upon the nature of the original sediments and the degree of alteration to which they have been subjected by the processes resulting in deposition of the sulphur.

MINERAL ANALYSES OF SULPHUR-BEARING DEPOSITS FROM THE RUSTLER SPRINGS SULPHUR FIELD.

J. E. Stullken, Analyst.

	a	b	c	d	e	f
Silica	2.34	10.66	34.54	37.20	8.60	49.34
Ferric oxide	0.15	0.08	11.44	0.27	0.32	0.16
Alumina	1.95	33.48	16.69	1.63	11.28	0.18
Titanic oxide	------	------	6.67	------	------	------
Phosphorus pentoxide	------	------	Trace	Trace	------	------
Lime	31.72	2.50	6.76	19.76	5.72	1.35
Magnesia	0.36	0.34	1.01	0.51	0.30	0.32
Sulphur trioxide	28.87	------	5.08	30.59	19.23	------
Sulphur, free	3.10	13.35	1.70	1.00	22.00	46.00
Sodium oxide	4.8[illegible]	6.14	0.70	0.34	1.24	------
Potassium oxide	0.08	0.19	1.16	0.34	1.37	------
Moisture	10.10	2.00	9.28	7.64	10.06	2.30
Loss on ignition	16.04	31.25	10.50	1.40	20.14	0.86
Total	99.66	99.99	99.53	100.68	100.21	100.51
Bauxite present		42.23		None	7.65	None

(a) Drab-colored porous rock containing much selenite. From the center of Section 34, Block 70. Sample taken by Dr. J. A. Udden.
(b) Pure white clay-like material containing considerable gypsum. From the southeast corner of Section 13, Block 70. Sample taken by Dr. J. A. Udden.
(c) Clay from the southeast corner of Section 13, Block 70. Sample taken by J. A. Martin, Jr., Toyah, Texas.
(d) Siliceous gypsite. Typical rock from the Johnson Prospect.
(e) Dark gypsiferous and conglomeratic material from beneath the hard conglomerate layer on the north side of locality marked 8 on the sketch map of the Michigan Sulphur and Oil Company property.
(f) Typical brown earthy material from the main exposure at the Cooksey Prospect.

PROBABLE ORIGIN OF THE SULPHUR.

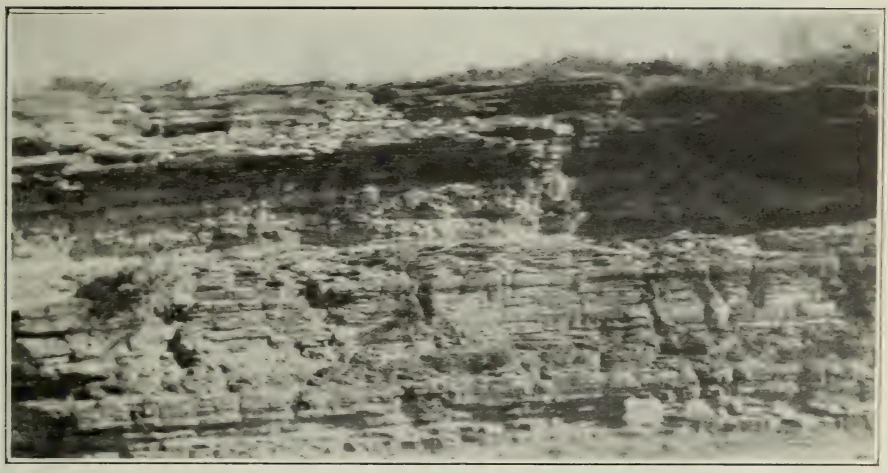
The facts that hydrogen sulphide gas is encountered all over this area, that sulphur is being deposited at the present time from the oxidation of this gas in solution or otherwise, and that much of the crystallized sulphur, judging by its location, must have been deposited by gases; lead one to believe that this mode of deposition was of considerable, if not of primary, importance in forming this deposit. The deposition of sulphur from this source seems to have depended largely upon the porosity of the inclosing material. It has been proved by Winogradsky that there are bacteria possessing the power to oxidize hydrogen sulphide to form sulphur.* Some of the sulphur, notably the light yellow kaolin-like variety, may be due to the deposition of colloidal sulphur from solution, since it has been proved that this can take place.**

It is not a very easy matter, however, to say just what is the ultimate source of the hydrogen sulphide. There are no evidences of volcanic disturbances in this district, and the nearest volcanic rocks are some forty miles distant, so it is not believed that the gases are due to dying vulcanism. Some of the sulphur may be formed by the action of hydrogen sulphide on calcium carbonate, which also produces gypsum. Some of the conglomerate beds, the pebbles in which were undoubtedly once carbonates, now altered to gypsum and containing sulphur, in places perhaps as replacements, lend some force to this view.

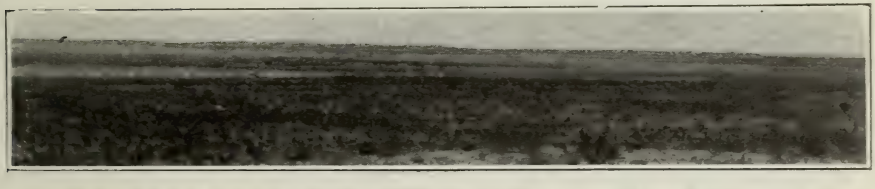
From the close association here of sulphur, gypsum, oil or bituminous material, it would seem possible, as advocated by most authors, that the sulphur has been formed from the reduction of gypsum by organic acids, but for the fact that this reaction, with one exception, has never been satisfactorily demonstrated in the laboratory under conditions approximating those obtaining in the field. The one exception noted was an experiment made by Hoppe-Seyler in 1886, using methane as the

*The Origin of Sulphur Deposits, by O. Stutzer, translated by W. C. Phalen, Economic Geology, Vol. 7, No. 8, p. 742.

**U. S. Geol. Surv., Bull. 530: "Two Sulphur Deposits in Mineral County, Colorado", by Esper S. Larsen and J. Fred Hunter; pp. 363-369.



a. Cliff on Delaware Creek, about one mile east of Delaware Springs. May represent the transition beds between the Delaware and the Castile Formation. Alternating limy and shaly beds down to yellow sandstone at the water's edge. There are some 20 feet of finely banded limestone at the top.



b. Typical plain of the Delaware Formation. Looking east from the top of a limestone-capped sandstone mesa. Edge of mesa shows in the foreground.

reducing agent. However, it has been shown that this reducing action readily takes place under bacterial influence.* It would be practically impossible, without extensive researches, to say just what part the reduction of gypsum, either with or without bacterial influence, has played in the formation of the sulphur.

A study of the log of the Troxel well shows that pyrite is abundant almost from the top to the bottom, while bituminous material is present quite frequently from 680 feet to the bottom of the well. Now, hydrogen sulphide may be formed both from the oxidation of pyrite and the decomposition of organic material. Judging from the Troxel well section, there must be considerable quantities of both materials in the Castile Gypsum and in the upper part of the Delaware Mountain formation, and the hydrogen sulphide may have been derived from either one or both of these sources. Judging, however, from the fact that the pyrite is usually unaltered, and that the organic material has been altered, either in situ or at greater depths, as the presence of oil indicates, it seems more reasonable to suppose that at least the greater part of the hydrogen sulphide has been and is being derived from organic material.

The physical nature of the beds, through which the hydrogen sulphide had to pass, certainly exerted considerable influence on the deposition of the sulphur. It is possible that those beds lending themselves most readily to alteration now contain the bulk of the sulphur. The sulphur dioxide noticeable in a number of places is probably due to the oxidation of the sulphur.

There are other ways in which sulphur may be formed, but it is not believed that they were of sufficient importance to be considered here.

---

*The Origin of Sulphur Deposits. O. Stutzer, translated by W. C. Phalen, Economic Geology, Vol. 7, No. 8, p. 738.

DEVELOPMENT.

It is not known at exactly what date work started in this district, but considerable prospecting had been done prior to Dr. Smith's trip there in 1896. Much of the work spoken of in the older reports is inaccessible now, due to caving of the ground; and the sulphur piles, formerly present around some of the pits, have either been washed away or have been oxidized to the gaseous state. Considerable work has been done in this district in the last two years. This later work has been more extensive and deeper than anything done in the past.

Many considerations enter into a discussion of the commercial possibilities of these deposits. The district is still in the prospect stage, but what has been shown up is sufficient to justify further investigation and development. Just how deep the deposits extend it is at present impossible to say. The deepest workings in the district extend down about 43 feet. There is good sulphur at the bottom of this deepest excavation and it probably continues for some distance further down. The only way to ascertain to what depth the deposits extend is to deepen the workings or to drill.

It may be of some interest in this connection to mention the fact that two wells drilled in the spring of 1916 by the Calumet and Arizona Mining Company on their property about 12 miles northeast of Fort Stockton in Pecos County, showed much disseminated sulphur in gypsum down to a depth of 550 feet. Cuttings from these borings have been examined by Prof. C. L. Baker from whom the information has been obtained. These two borings are close together at a point where some fourteen years ago another boring was made to the depth of 1200 feet. In this boring considerable sulphur was encountered at depths between 200 and 600 feet below the surface.* These borings were made at a point 90 miles southeast from the sulphur fields in Culberson County. The finding of deep sulphur at this distance has, of course, no direct bearing on the depth to which

*University Mineral Survey Bulletin 9, November, 1904, p. 65. "Reconnaissance in Trans-Pecos Texas", by G. B. Richardson.

sulphur may extend in Culberson County, but the circumstances of accumulation of sulphur in both of these places are probably related. We have at Fort Stockton, underlying the Comanchean, Permian rocks which are not far from being of the same age as the underlying formations in Culberson County. The source of the sulphur is probably some deeper underlying beds in both localities, as in many cases there is nothing on the surface to indicate the presence of the sulphur below.

Sulphur is such a low priced commodity that a considerable tonnage should be blocked out before any attempt is made to extract and market the product. This does not mean that a great deal of experimenting should not also be done in order to try to improve the present method of steam extraction. This process probably does not extract more than two-thirds of the contained sulphur.* As the deposits lie quite close to the surface, the mining of the sulphur-bearing rock can be done very cheaply.

Good water is very scarce in this region. A limited supply of water rather highly charged with mineral salts can be obtained by drilling in various places, mostly in the beds of gypsum in the draws.

There is no permanent fuel supply in the country. Local groves of juniper would furnish fuel for a limited period. Coal will sooner or later have to be imported. The cost of this coal at any of the properties east of the Rustler Hills would range from about $4.50 to $7.00 a ton, depending upon the quality. Up to date, only limited quantities of oil have been found in this region and it cannot be counted upon for fuel.

The distance from the nearest railroad is considerable, and it would not be feasible to build a branch line to the deposits, unless production on a very large scale was contemplated, because the sulphur would constitute practically all of the outgoing freight.

With some work, the wagon roads can be kept in fair condition, except when it rains, and motor trucks and trailers may be profitably used.

After the war, the price of sulphur will probably drop to

*E. G. Woodruff, U. S. Geol. Surv. Bull. 380, pp. 373-380.

somewhere near that point which it occupied before the war, and this fact should be remembered in considering future development.

It is hardly possible that the Culberson County sulphur can compete in the eastern market with the Louisiana-Texas coastal deposits, and thus it appears probable that a western market will have to be found for any sulphur produced in West Texas. If one company could acquire control of several of the properties on which some development has been done, their chances of success would be much better than the chances of smaller companies operating independently.

In conclusion, I may say that in my judgment it will take the most economical and intelligent working and it will also require considerable capital to place any of these properties on a paying basis.

WATER RESOURCES.

Water is scarce in the entire field, and little has as yet been done to develop what water resources there may be in existence. Natural underground waters are to be expected to be highly mineralized. Even surface waters, except after heavy rains, are high in solvent solids. For dscussion of earlier observations on this subject, the reader is referred to G. B. Richardson's Report of a Reconnaissance in Trans-Pecos Texas, Bulletin of the University of Texas No. 23. The following analyses show the quality of some samples of water collected in that region recently. The ground waters contain more than twice the amount of solids found in the already highly concentrated surface waters in these analyses.

(Determinations given in parts per million)

Ions determined	1	2	3	4	5
Calcium	978	974	1263	1148	1384
Magnesium	259	168	303	604	384
Sodium and potassium (calculated as Sodium)	2025	2530	5990	8540	8538
Sulphate radicle	2645	2563	3039	3660	3886
Bicarbonate radicle	106	117	451	398	307
Chloride radicle	3590	4150	9825	13780	13651
Sulphur as Hydrogen Sulphide	32	None	92	65	None
Total dissolved solids (Dried 1 hr. at 180° C)	10054	10538	21182	27813	28808

1..From head of draw east of Lindsey's property. (Anal. 3137).
2..Running water in creek northwest of Maverick Spring, Culberson County, collected by W. B. Phillips, Oct. 16, 1916. (Anal. 3138).
3..Water from a big deep pool in draw near road to W. B. Hicks' house, collected by W. B. Phillips, Nov. 17, 1916. (Anal. 3134).
4..Water from seep below Maverick Spring; collected by W. B. Phillips, Nov. 17, 1916. (Anal. 3135).
5..Water from a well in northwest part of Sec. 1, Block 111, Culberson County, at depth of 23 ft. Collected by W. B. Phillips, Dec. 1, 1916. (Anla. 3143).

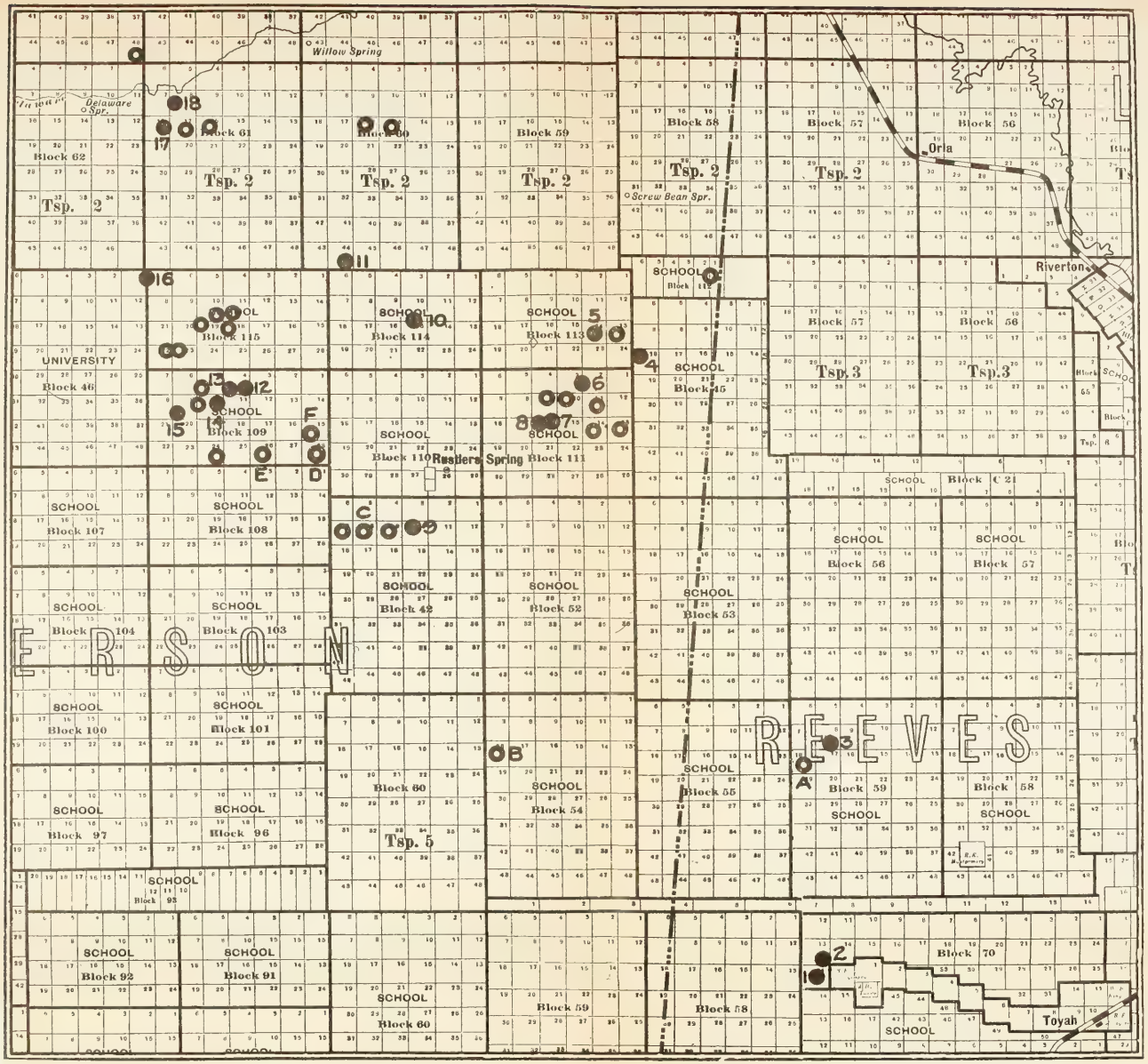
INDEX.

Page

Albritton, Vergil 12
Analyses of sulphur..... 59
Analyses of sulphur matrix..... 59
Analyses of sulphur ore.....60, 61
Analyses of water..... 67
Arsenic 59
Association of sulphur with matrices..... 59
Baker, C. L. 64
Barometric pressure 33
Blackburn, M. S. 12
Blake, Wm. P. 10
Block, 112 29
Bose, Emil 7
Brown siliceous matrix..... 58
Caliche 8
Calumet and Arizona Mining Co..... 64
Castile formation 13, 19, 20
Caverns in the Permian..... 14
Chemical composition of sulphur and its matrix..... 59
Chimneys 8
Coal 65
Comanchean 13, 14
Conclusion 66
Cooksey Prospect, the..... 46
Cream-colored massive sulphur..... 57
Cretaceous 13, 22
Cummins, W. F..... 10
Dark ground 58
Deep borings 14, 18
Delaware Creek 19
Delaware formation 13, 19
Delaware Mountains 19
Deposits near Walker's ranch..... 48
Development 64
Dot Prospect, the..... 29
Doyle, W. A..... 12
Felch, F. W.....12, 31, 32, 34
Felch Gas Well, observations on..... 33
Flint pebbles 58
Foreword 7
Fort Stockton 64
Fuel 65
Gas well 33

Page
Georgetown Prospect, the 45
Grant Mines property, and vicinity 51
Green crystallized sulphur 56
Green massive sulphur 57
Grossman, Gustav 12
Guadalcupian 18
Gypsite 58
Hicks, W. B 67
Huling-Ross well 18
Hunter, J. Fred 62
Introduction 10
Johnson Prospect, the 24
Kinds of matrix containing sulphur 57
Kyle Prospect, the 25
Larsen, Esper S 62
Log of hole on Dallas Claim 35
Manufacturers Record 11
Martin, J. A 12, 61
Matrix containing sulphur, kinds of 57, 59
Michigan Sulphur and Oil Co 35
Observations on Felch gas well 33
Open Cut on Section 8, Block 61 54
Open Cut on Sec. 14, Bl. 113 28
Origin of the Sulphur 62
Orla 10
Pecos County 64
Permian 13
Permo-carboniferous 13
Phalen, W. C 62, 63
Phillips, Wm. B 11, 12, 67
Pit in Center of Sec. 34, Bl. 70 24
Pit in S. E. Cor. of Sec. 13, Bl. 70 24
Pleistocene 13
Pope, John 10
Porch, Jr., E. L 7
Price of Sulphur 65
Prospecting on Sec. 13, Bl. 113 28
Prospects on and near the University lands 50
Quaternary 13, 22
Railroad facilities 65
Recent 13
Red beds 14, 22
Reported sulphur locations 55
Richardson, G. B 11, 64, 67
Roads 65
Rothwell, John E 11

Page
Rustler formation 13, 21
Rustler Hills 13
Sec. 8, Block 61, open cut on 54
Shumard, Geo. G 10
Silvery white massive sulphur 57
Skeats, E. M 11
Smith, Eugene A 11
Spann-Felch holdings 31, 36
Steeruwitz, W. von 10
Stinking Seep prospect, the 47
Structure 13
Stullken, J. E 60, 61
Stulzer, O. 62, 63
Sulphur analyses 59
Sulphur and Oil Co., the Michigan 35
Sulphur deposits, description of 24
Sulphur, from the gulf coast 66
Sulphur locations reported 55
Sulphur ore, analyses of 60, 61
Sulphur, origin of the 62
Sulphur, price of 65
Sulphur, types of 56
Troxel, C. R 12
Troxel Well No. 2 14
Types of sulphur 56
Udden, J. A 9, 12, 14, 18, 24, 61
University lands, prospects on and near 50
Virginia property, the old 35
Walker's Ranch, deposits near 48
Water analyses 67
Water resources 65, 67
West Texas Sulphur Co 27
Yellow crystallized sulphur 56
Yellow massive sulphur 56



Map Showing Locations of the Rustler Springs Sulphur Deposits

Properties visited.

1. . . . Pit in center of Section 34, Block 70.
2. . . . Pit in southeast corner of Section 13, Block 70.
3. . . . The Johnson Prospect.
4. . . . The Kyle Prospects.
5. . . . Open cut on Section 14, Block 113.
6. . . . The Dot Prospect.
7. . . . The Spann-Felch Holdings.
8. . . . The Holdings and Works of the Michigan Sulphur and Oil Company.
9. . . . The Georgetown Prospect.
10. . . . The Stinking Seep Prospect.
12-15. . Deposits near Walker's Ranch: (12) Section 4, Block 109; (13) Section 4, Block 109; (14) Section 9, Block 109; (15) Section 10, Block 109.
16. . . . Deposits on and near the University Land.
17. . . . The Grant Mines Property and Vicinity.
18. . . . Open Cut on Section 8, Block 61.

Properties not visited.

A. The Luckett Property.
B. The Wildcat Prospect.
C. The Pat, Lone Wolf, and Golson Prospects.
D. The Edwards Property.
E. The Maracopa Prospect.
F. The Toyah Sulphur Company of Louisiana.

Some of the Buildings of the Medical Department

B40-217-53h

University of Texas Bulletin

No. 1724: April 25, 1917

CATALOGUE

of the

Department of Medicine
Galveston, 1916-1917

Including Announcements for 1917-1918

Published by the University six times a month and entered as second-class matter at the postoffice at
AUSTIN, TEXAS

The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston

Cultivated mind is the guardian genius of democracy. . . . It is the only dictator that freemen acknowledge and the only security that freemen desire.

President Mirabeau B. Lamar

CONTENTS

DEPARTMENT OF MEDICINE—	PAGE
Regents	1
Faculties	3
Calendar	5
SCHOOL OF MEDICINE—	
Historical Sketch	7
Buildings and equipment	7
University Hall	8
Facilities for teaching	8
Library and Reading Room	10
Museums	11
Hospital facilities	12
Requirements for admission	13
Exemptions	20
Advanced standing	21
Examinations and class standing	21
Requirements for graduation	23
Plan of instruction	23
Departments of instruction	25
Summary of hours to each subject	50
Scholarships	51
John Sealy Hospital	52
Roster	59
Text-books	66
Degrees	68
Hospital appointments	69
Associations	71
Expenses	72
SCHOOL OF PHARMACY—	
Announcement	75
Requirements for admission	75
Examinations and class standing	77
Plan of instruction	78
Departments of instruction	79

SCHOOL OF PHARMACY—Cotinued. PAGE
Library 85
Scholarship 85
Roster 86
Textbooks 90
Degrees 90
Associations 91
Expenses 91

SCHOOL OF NURSING—
Staff 94
General information 95
Requirements for admission 96
Course of training and instruction 98
Textbooks 99
Roster 100
Graduates in nursing 103

CATALOGUE OF STUDENTS IN THE DEPARTMENT OF MEDICINE 104

SUMMARY OF STUDENTS IN THE DEPARTMENT OF MEDICINE 114

ATTENDANCE BY YEARS 114

AFFILIATED SCHOOLS 115

1917

January

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
4	15	16	17	18	19	20
1	22	23	24	25	26	27
8	29	30	31			

February

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
1	12	13	14	15	16	17
8	19	20	21	22	23	24
5	26	27	28			

March

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
1	12	13	14	15	16	17
8	19	20	21	22	23	24
5	26	27	28	29	30	31

April

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
5	16	17	18	19	20	21
2	23	24	25	26	27	28
9	30					

May

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
3	14	15	16	17	18	19
0	21	22	23	24	25	26
7	28	29	30	31		

June

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
0	11	12	13	14	15	16
7	18	19	20	21	22	23
4	25	26	27	28	29	30
1	25	26	27	28	29	30

July

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

August

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

September

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

October

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

November

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

December

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

1918

January

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

February

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

March

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

April

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

May

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

June

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

July

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

August

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

September

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

October

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

November

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23

December

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

BOARD OF REGENTS

FRED W. COOK, Chairman *(till April 24)*
WILBUR P. ALLEN, Chairman *(after April 24)*

Terms expire January, 1917

DAVID HARRELL.....Austin
WILL C. HOGG.....Houston
ALEXANDER SANGER.....Dallas

Terms expire January, 1919

FRED W. COOK.....San Antonio
A. W. FLY, M. D. .....Galveston
GEORGE W. LITTLEFIELD.....Austin

Terms expire January, 1921

W. R. BRENTS.....Sherman
M. FABER*.....Tyler
S. J. JONES.....Salado
G. S. MCREYNOLDS, M. D. .....Temple

Terms expire January, 1923

WILBUR P. ALLEN.....Austin
J. W. BUTLER.....Clifton
C. E. KELLEY.....El Paso

E. J. MATHEWS, Secretary, Austin.

*Resigned December, 1917.

Standing Committees (till April 24)

AUDITING: McReynolds.
BUILDINGS AND GROUNDS: Harrell, Littlefield, Fly.
COMPLAINTS AND GRIEVANCES: Hogg, Jones.
EXECUTIVE: Hogg, Sanger, Cook.
FINANCE: Sanger, Littlefield, Jones.
LAND: Littlefield, Sanger, Harrell.
LEGISLATION: Harrell, Littlefield, Hogg, Cook.
MEDICAL DEPARTMENT: Fly, Hogg, McReynolds.

Standing Committees (after April 24)

AUDITING: McReynolds, Butler.
BUILDINGS AND GROUNDS: Allen, Kelley, Fly.
COMPLAINTS AND GRIEVANCES: Cook, Jones, Brents.
EXECUTIVE: Allen, Fly, Littlefield.
FINANCE: Brents, Littlefield, Butler.
LAND: Littlefield, Butler, Brents.
LEGISLATION: Butler, Cook, Littlefield.
MEDICAL DEPARTMENT: McReynolds, Fly, Kelley.
SCHOOL OF MINES: Kelley, McReynolds, Jones.

The Board of Regents meets in Austin on the fourth Tuesdays of April and October and on the day preceding Commencement Day, and in Galveston in May on the day on which the graduating exercises of the Department of Medicine are held.

DEPARTMENT OF MEDICINE

FACULTIES

ROBERT ERNEST VINSON, D. D., LL. D., *President.*

School of Medicine

EDWARD RANDALL, M. D., *Professor of Materia Medica and Therapeutics.*

WILLIAM KEILLER, L. R. C. P. AND S. (ED.), F. R. C. S. (ED.), *Professor of Anatomy.*

JAMES EDWIN THOMPSON, M. B., B. S. (LOND.), F. R. C. S. (ENG.), F. A. C. S., *Professor of Surgery.*

SETH MABRY MORRIS, B. S., M. D., *Professor of Ophthalmology and Otology.*

WILLIAM SPENCER CARTER, M. D., *Professor of Physiology, Dean of the Medical Department.*

MARVIN LEE GRAVES, M. A., M. D., *Professor of Medicine.*

GEORGE HENDERSON LEE, M. D., *Professor of Obstetrics and Gynecology.*

HENRY CHARLES HARTMAN, M. D., *Professor of Pathology.*

P. W. COVINGTON,* M. D., *Professor of Preventive Medicine.*

WILLIAM CUMMING ROSE, B. S., PH. D., *Professor of Biological Chemistry.*

MARIE CHARLOTTE SCHAEFER, M. D., *Associate Professor of Histology and Embryology.*

DAVID HENRY LAWRENCE,* PH. G., M. D., *Associate Professor of Medical Jurisprudence.*

HARRY O. KNIGHT, B. A., M. D., *Associate Professor of Anatomy.*

ALLEN GEORGE HEARD, M. D., *Associate Professor of Pediatrics and Medicine.*

CHARLES BELL MCGLUMPHY, PH. C., M. D., *Adjunct Professor of Bacteriology.*

ALBERT OLIN SINGLETON, B. S., M. D., *Adjunct Professor of Surgery.*

*Absent on leave during the session of 1916-1917.

HERBERT LEE MCNEIL, B. A., M. D., *Adjunct Professor of Medicine and Clinical Pathology.*

EDWARD RANDALL, M. D., *Lecturer on Physical Diagnosis.*

RAOUL RENE DANIEL CLINE, B. S., M. A., PH. G., M. D., *Lecturer on Pharmacy.*

MARVIN LEE GRAVES, M. A., M. D., *Lecturer on Nervous and Mental Diseases.*

ALBERT OLIN SINGLETON, B. S., M. D., *Lecturer on Genito-urinary Diseases and Dermatology.*

WALTER PARRY BREATH, M. D., *Lecturer on Otology, Rhinology, and Laryngology.*

DICK PARKER WALL, M. D., *Lecturer on Medical Jurisprudence.*

FREDERICK WORLEY AVES, M. D., *Instructor in Surgery.*

WILLARD RICHARDSON COOKE, B. A., M. D., *Instructor in Gynecology.*

JESSE AUTREY FLAUTT,* M. D., *Instructor in Obstetrics.*

VIOLET HANNAH KEILLER, B. A., M. D., *Instructor in Surgical Pathology.*

CHARLES TURNER STONE, B. A., M. D., *Instructor in Clinical Medicine.*

LAWRENCE EVANS CHAPMAN, B. A., M. D., *Instructor in Physiology and Pharmacodynamics.*

SCOTT STUART FAY, B. S., M. A., M. D., *Instructor in Bacteriology.*

WILLIAM BOYD READING, M. D., *Instructor in Clinical Medicine.*

MOISE DREYFUS LEVY, M. D., *Instructor in Clinical Pathology.*

OTTO JAMES POTTHAST, M. D., *Instructor in Anatomy.*

MERT HAWKINS STARNES, M. D., *Instructor in Pathology.*

MARGUERITE ICKES, B. A., M. A., *Instructor in Histology and Embryology.*

ETHEL LYON HEARD, M. D., *Instructor in Gynecology.*

ESTILL LEE RICE, M. D., *Instructor in Medicine.*

EARL WILLIAM CLAWATER, M. D., *Instructor in Surgery.*

BENJAMIN FRANKLIN SMITH, JR., M. D., *Instructor in Obstetrics.*

FRANK W. DIMMITT, JR., PH. G., *Fellow in Biological Chemistry*

BASIL ALEXANDER HAYES, B. A., *Assistant in Pathology.*

EARL DEAN CRUTCHFIELD, B. A., *Assistant in Pathology.*

WILLIAM SHELTON BARCUS, *Assistant in Surgical Pathology.*

---

*Resigned February, 1917.

HENRY LEIGH BARTLETT, PH. G., *Assistant in Chemistry.*
ORAN ROBERT LASATER, B. A., *Assistant in Anatomy.*

School of Pharmacy

EDWARD RANDALL, M. D., *Professor of Materia Medica and Therapeutics.*
RAOUL RENE DANIEL CLINE, B. S., M. A., PH. G., M. D., *Professor of Pharmacy.*
WILLIAM CUMMING ROSE, B. A., PH. D., *Profesor of Biological Chemistry.*
WALTER T. GARBADE, B. S., PH. G., *Adjunct Professor of Chemistry.*
JOHN C. BUCKNER, PH. G., *Lecturer on Botany and Pharmacy.*
FRANK W. DIMMITT, JR., PH. G., *Fellow in Biological Chemistry.*

School of Nursing

ETHEL D'ARCY CLAY, R. N., *Clinical Instructor in Nursing.*
EDNA MONROE, R. N., *Assistant Instructor in Nursing.*
HELEN TOWNSEND LISTER, B. A., *Instructor in Invalid Cooking.*

THOMAS H. NOLAN, *Provost of the Medical Department and Secretary of the Faculty.*
MARGARET E. CALFEE, *Librarian.*
ROSE E. NOLAN, *Administrative Secretary.*
EDNA MONROE, *Superintendent of University Hall.*

CALENDAR FOR THE TWENTY-FIFTH ANNUAL SESSION 1917-1918

Examinations for the removal of conditions and for advanced standing or exemptions will be held September 27, 28, and 29, 1917.

Registration days, September 27, 28, and 29, and October 1, 1917
Opening exercises.....Monday, October 1, 1917
Thanksgiving day.....Thursday, November 29, 1917
Christmas holidays, December 23, 1917-January 2, inclusive, 1918
Mid-year examinations begin.....January 26, 1918

Washington's Birthday.....February 22, 1918
Texas Independence Day.....March 2, 1918
Final examinations for graduating classes begin...May 10, 1918
Final examinations for other classes begin.....May 15, 1918
Graduating exercises.....May 31, 1918

SCHOOL OF MEDICINE

ANNOUNCEMENT FOR THE TWENTY-SEVENTH ANNUAL SESSION, 1917-1918

Historical Sketch

The first annual session of the Medical Department of the University of Texas began on October 1, 1891, and closed on April 22, 1892.

The twenty-sixth annual session opened on Monday, October 2, 1916, and will close with appropriate exercises on Thursday, May 31, 1917.

The twenty-seventh annual session will begin on October 1, 1917, and will continue until May 31, 1918.

The sixth was the last session open to matriculates desiring to graduate under the requirement of three annual sessions for the completion of the course; four annual sessions of eight months each are required for graduation of all students matriculating for the existing course of instruction.*

Grounds and Buildings

The College Building occupies a block of ground situated on Avenue B, between Ninth and Tenth Streets; and upon the contiguous block, between Eighth and Ninth Streets, is situated the John Sealy Hospital, the property of the state, and a part of the Medical Department of the University. The College Building was erected in 1890 at the cost of $86,000, exclusive of furnishings and equipment. It is a large and commodious building, modern in construction and imposing in architecture. It contains three large lecture theaters; anatomical, chemical, pharmaceutical, physiological, pathological, histological, and bacteriological laboratories; museums, library, and reading-room; faculty room, officers' rooms, and also rooms and laboratories

*The authorities reserve the right of addition to, subtraction from, and modification of the announcements of this catalogue as they shall deem for the best interests of the school and the students.

occupied by the School of Pharmacy. The building is well lighted by side windows and skylights, is fitted throughout with gas and water, and is heated by steam.

For a description of the John Sealy Hospital, see pages 52-58.

University Hall

University Hall, erected in 1897, at a cost of about $40,000, was given by Mr. George W. Brackenridge, of San Antonio, in order to encourage women to enter the professions, especially the profession of medicine. It provides the comforts of a home for women students in the Schools of Medicine and Pharmacy.

The Hall is a handsome brick building of three stories, the second and third of which are divided into about thirty rooms, including living rooms, bedrooms, bathrooms, parlors, etc. On the first floor are reception rooms, dining room, kitchen, etc. The building is heated by steam and lighted by electricity. The rooms are well furnished, and are rented to women students for $5.00 a month.

The superintendent of University Hall, Miss Edna Monroe, lives in the building and looks well after the comfort of the women students who reside there.

FACILITIES FOR TEACHING

Laboratories

The various departments of the Medical School were well equipped when it was organized in 1891. The equipment has been added to every session as the attendance has increased, and at present each laboratory is fully provided with all the apparatus and supplies required for teaching and for original investigation.

The laboratories of chemistry and of pharmacy occupy the first floor. The chemical laboratory has 275 working desks completely equipped with all the apparatus and reagents necessary for individual work by the students in performing chemical experiments.

The laboratory of pharmacy is also fully equipped with ap-

paratus and the facilities required for practical instruction, and has a large collection of drugs and pharmaceutical preparations. While this laboratory is used chiefly by the School of Pharmacy, it is also used for giving practical instruction to the medical students in materia medica and pharmacy in the freshman year.

On the second floor is the physiological laboratory, consisting of a large room for practical instruction and of other rooms for preparation and research. This laboratory is thoroughly equipped with physiological apparatus for investigation and demonstration, and in addition has fifteen complete sets of apparatus for student exercises, made after the Harvard models, so that the students, working in sections of thirty or less, perform all but the most difficult experiments themselves. Demonstrations in pharmaco-dynamics are also given in this laboratory.

On the third floor the laboratories of pathology and histology, each equipped with microscopes and working tables, provide for individual work in the practical instruction in these subjects by each member of the class, which is divided into sections for this purpose.

The laboratory of bacteriology, also on the third floor, is provided with microscopes having oil-immersion lenses, and with all apparatus necessary for practical exercises in bacteriology.

The laboratory of anatomy occupies the entire fourth floor, and is well lighted by ceiling and side lights (see Museum of Anatomy, page 11). The supply of anatomical material is adequate, and its preservation is ideal for purposes of dissection.

The laboratory of clinical medicine is on the first floor of the Nurses' Home, adjacent to the hospital. It is thoroughly equipped with apparatus and microscopes having oil-immersion lenses, for individual work in the systematic study of clinical pathology and also in the clinical study of patients in the medical outdoor clinic by members of the junior class and in the medical wards of the hospital by the senior students.

In the basement of the College Building there is a machine shop in charge of a skilled mechanic. The shop is fitted up

for all kinds of metal and woodwork. Much of the apparatus in use in the different laboratories is either made or repaired here.

When the College Building was repaired after the storm of 1900, many alterations and improvements were made, especially in the library and in the laboratories of anatomy, bacteriology, physiology, and pharmacy.

It is the policy of this school to attach little value to purely didactic teaching. Lectures, recitations, and demonstrations are regarded as necessary to enable the students to get the greatest benefit from the laboratory instruction, but the practical work in the laboratories and clinics is considered the most important part of the teaching. The students do not merely see others demonstrate how to do things. Each subject is taught in a practical manner, and whenever it is practicable the students themselves perform experiments, prepare and study specimens, examine patients, etc. The students are graded upon their attendance and practical work in the laboratories, clinics, ward classes, etc., and this record constitutes a part of the term grade in each subject.

The individual instruction and the positive knowledge acquired by the student's own personal observations are regarded as being of the utmost importance in giving the scientific training necessary for the work of the medical profession.

Library and Reading-room

MARGARET E. CALFEE, *Librarian*

The library occupies the east end of the first floor of the College Building. The large room at the end of the hall is the reading-room; the two adjoining rooms contain cases and stacks for journals, and the fourth is used for sorting and storing duplicate journals and incomplete files of same. The reading-room is well lighted, is supplied with chairs and tables, and students may read or study here from 8 a. m. to 5 p. m. The most important modern medical textbooks, books of general reference, such as encyclopedias, indexes, etc., and the best Amer-

ican and foreign medical journals are kept in cases in the reading-room, and the students have easy access to them.

The library includes 9477 volumes and 2038 pamphlets, some of which have been given by generous physicians. Most of the library has been acquired by purchase. After the storm of 1900 over $4000 was expended in restoring the library. Since that time an annual appropriation of $1000 has been used in adding the more important texts and monographs and in completing many of the files of journals used for reference in making original investigations.

The books are classified according to the Dewey system, and are catalogued by author, subject, and title, so that they can readily be used for consultation in the reading-room or for withdrawal from the library.

The library is in charge of the librarian, who devotes her entire time to it.

Regular physicians, other than those of the teaching staff, may consult books and journals in the library, but the privilege of withdrawing them from the library is limited to those connected with the Department of Medicine.

Museums

Instead of one general museum, there are special collections of typical specimens in connection with the different laboratories, which make possible their use for teaching purposes.

Museum of Anatomy

The museum of anatomy is no mere collection of rare specimens, but is an integral part of the teaching equipment, being composed of specimens which have been prepared for their teaching value. The specimens are displayed and labeled with full descriptions on cards or in hand-books, so that the student can acquaint himself with their anatomy. The bones are painted, labeled, described, and fixed to tables conveniently arranged for study; ossification is illustrated by mounted specimens; sections and dissections of the eye, ear, brain, limbs, trunk, pelvis, head, etc., are displayed with full description; wax models of em-

bryology and special dissections and models for illustrating applied surgical anatomy are also used.

The Department of Anatomy is constantly increasing the size and usefulness of this portion of the teaching equipment.

Museum of Pathology

The museum of pathology affords, as aids in teaching, a great variety of pathological specimens, especially those showing the gross lesions and their practical application to medicine and surgery. The collection consists of more than sixteen hundred specimens, which have been brought together during a number of years, and is constantly being enlarged. Each specimen is labeled with the serial number of the museum, the diagnosis, and the name of the donor. The history of each case, as far as obtainable, together with a description of the gross and microscopic findings, is recorded in a catalogue kept for that purpose. The most important specimens are of great value and easy of access for teaching purposes. Students and physicians have access to the shelves at all times, and the specimens are continually used in class-room demonstrations.

It is earnestly recommended that physicians throughout the state interest themselves in this museum. Any material illustrating interesting pathological conditions of organs or tumors, early fetuses, monsters, etc., may be put in a five per cent solution of formalin or strong alcohol and forwarded at the expense of the laboratory. Full credit will be given to the donor, and, if desired, a report of the microscopic findings will be promptly forwarded to him.

Hospital Facilities

During the past year there have been treated in the wards of the John Sealy Hospital 3621 patients, exclusive of a large number of outdoor patients, who also furnish clinical material for the instruction of the classes. The resources for illustration of medical ailments, surgical affections and accidents, and their management are ample. Daily clinics are given throughout the entire session by members of the faculty and by special lectures.

Much attention is devoted to bedside instruction, in which the students are required to accompany the teachers through the wards and practically acquire the methods of diagnosis and treatment. The members of the senior class serve as clinical clerks in the hospital wards, sections of the class rotating in the different departments of the hospital for this purpose. For a full statement of the work done in the John Sealy Hospital, see pages 57-58.

During the past year there were 6849 new cases and 8939 old cases treated in the outdoor clinics or dispensaries.

These outdoor clinics have been organized so that each junior student receives the benefit of a period of this clinical work, in its several departments—medicine, surgery, obstetrics, and gynecology, and special diseases.

St. Mary's Infirmary, an excellent hospital under the care of the Sisters of the Incarnate Word, is situated at Market and Eighth Streets, only two blocks from the College.

ADMISSION

Men and women are admitted to the School of Medicine on equal conditions, as follows:

1. Age and Character

Candidates must be at least eighteen years of age, and each candidate less than twenty-one years of age must present a written statement from a parent or guardian showing permission to matriculate.

Applicants must furnish evidence of good moral character and fitness for the profession of medicine. Students coming from other colleges must present letters of honorable dismissal.

2. Vaccination

Candidates must present evidence of proper vaccination at a date sufficiently recent to insure protection against smallpox, or be vaccinated upon matriculation.

3. Legal Requirements

Under the Medical Practice Act of 1907, the regulations of the Texas State Board of Medical Examiners require that applicants for the license to practice medicine in Texas, in order that they may be eligible to the examination for such license, shall have obtained from the board, at the time of admission to a medical college, a certificate of satisfactory preliminary education.

The University of Texas requires credit for ten college courses including five prescribed subjects, in addition to fourteen and a half entrance units, as the minimum entrance requirement. The State Board of Medical Examiners issues its certificate upon credit for a full high-school course of the first class, followed by five college courses. Those who can satisfy the admission requirements of the University have no difficulty in securing the certificate of the State Board of Examiners. The certificate of the State Board of Medical Examiners should be obtained from the secretary of the board before admission. The requirements of the State Board of Medical Examiners must be satisfied independently of those of the University.

4. Scholarship

The standard of admission to the School of Medicine is fourteen and a half units of high-school credit as specified under A below and, in addition, two years of college work consisting of ten full courses in the College of Arts of the University of Texas as specified under B below, or their equivalent in another institution of good standing.

The standard of fourteen and one-half units is not an increase over the fourteen unit standard of previous years. The apparent increase is due to rating algebra at two instead of one and one-half units in recognition of the fact that high-school work in algebra now generally covers two full years or more.

A. A unit of high-school credit implies a full session of high-school study of five class periods a week at least forty minutes long.

Among the units presented must be the following: three

units in English; two units in history; two units in algebra, one unit in plane geometry; two units in one foreign language. The remainder may be selected from the list below. It is urged that Latin should be included. The requirement of two units in a foreign language may be absolved by one college course in German or French, in case a foreign language has not been included in the high-school course.

Subjects and Units That May Be Presented for Admission

English, 3 or 4.
History and Civics:
- Ancient History, 1.
- Medieval and Modern History, 1.
- American History, 1.
- English History, 1.
- Civics, ½.

Mathematics:
- Algebra, 2.
- Plane Geometry, 1.
- Solid Geometry, ½.
- Trigonometry, ½.

Foreign Languages:
- Latin, 2 or 3 or 4.
- Greek, 2 or 3.
- German, 2 or 3.
- French, 2 or 3.
- Spanish, 2 or 3.

Natural Sciences:
- Biology, 1.
- Botany, 1.
- Chemistry, 1.
- Introduction to Science, 1.
- Physics, 1.
- Physiography, ½.
- Physiology and Hygiene, ½.
- Zoology, 1.

Vocational Subjects:
- Agriculture, ½ to 2.
- Bookkeeping, 1.
- Domestic Art, ½ or 1.
- Domestic Science, ½ or 1.
- Drawing, ½ or 1.
- Manual Training, ½ or 1.
- Stenography and Typewriting, 1.

B. A full course in the College of Arts of this University implies three class-room hours a week or their equivalent throughout the year. Two hours of preparation are expected for each class-room hour. Three hours of laboratory work are counted as equal to one class-room hour and the preparation for it.

Among the ten college courses must be included one in biology, one in physics, one in chemistry, one in English, and one in German or French.

Candidates for admission must present full statements from the colleges previously attended, signed by the proper authority, certifying to the following points:

(1) Honorable dismissal; (2) the number of admission credits allowed, and the mode of admission, *i. e.*, whether by examination or by acceptance of credentials from approved schools; (3) the college courses completed, giving the number of hours a week and the number of weeks devoted to each subject. The lecture and laboratory hours must be stated separately for courses in chemistry, biology, and physics. A catalogue of the college previously attended must also be presented. All applications for admission to the School of Medicine should be made out on the regular blanks of the University of Texas. These are passed upon by the committee of the general faculty of the Main University on the admission of students from other colleges.

Any one who expects to enter the School of Medicine is urged to send such certificate and catalogue as early in the summer as possible, and certainly before the registration days (September 28 to October 1) in order that the value of the admission credits may be properly determined before the time for matriculation.

Much time and trouble may be saved if applicants for admission will obtain these statements in duplicate. One of these is required by the State Board of Medical Examiners in issuing the entrance certificate, as explained above, and the other is necessary for admission to the University.

Work Preparatory to Medicine

While two years' college work of ten courses is now the requirement for admission to the School of Medicine, it is much better to take more college work than the minimum requirement. For students so situated as to make this possible, one of the groups offered by the College of Arts in the Main University at Austin is suggested. In any of these groups if German or French or German and French be used to absolve part of the admission requirements to the College of Arts, advanced work in either or both of these subjects may be taken, or additional electives chosen in lieu thereof. Students are advised to present Latin and one other foreign language for admis-

sion rather than other subjects. At least the last year of academic study in each group must be spent at the University of Texas.

Group I. Leading to the Degree of Bachelor of Arts

On the completion of this group the degree of Bachelor of Arts will be conferred.

Freshman Year:

English 1	1
German A	1
Mathematics 1	1
Physics 1	1
Zoology 1	1
	5

Physical Training.

Sophomore Year:

English 2 or 3	1
German 1	1
French A	1
Chemistry 1	1
Zoology 4	1
	5

Physical Training (as soon as adequate facilities are provided).

Junior Year:

French 1	1
Chemistry 2	1
Zoology 410	1½
Economics 1 or Government 1; or Psychology 101f and Zoology 105w and 106s	1
Elective	½
	5

Senior Year:

Chemistry 411	$1\frac{1}{3}$
Psychology 101f and Zoology 105w and 106s; or Economics 1 or Government 1	1
Electives	$2\frac{2}{3}$
	5

Psychology 141w and 142s are recommended as electives.

The student must make an average grade of at least C on his last ten courses, and must show such ability to write clear and correct English as to satisfy the Committee on Students' Use of English.

The numbers used in these groups refer to courses in the College of Arts of the Main University at Austin. Full information concerning them may be obtained from the general catalogue of the University of Texas.

Group II. Leading to the Degree of Bachelor of Arts

The group is arranged for those who intend to go to the Medical Department at Galveston, and who can not well afford to give four years to preparatory training. A student who completes this group and the first two years in the School of Medicine at Galveston will receive the degree of B. A., to be conferred, according to his preference, either at Austin or at Galveston. Thus the two degrees may be taken in seven years.

Freshman Year:

English 1	1
German A	1
Mathematics 1	1
Physics 1	1
Zoology 1	1
	5

Physical Training.

Sophomore Year:

English 2 or 3	1
German 1	1
French A	1
Chemistry 1	1
Zoology 4	1
	5

Physical Training (as soon as adequate facilities are provided).

Junior Year:

Chemistry 2 or 440	1 or 1⅓
Economics 1 or Government 1	1
Psychology 101f, 141w, and 142s; or Psychology 101f and Zoology 105w and 106s	1
Elective	2 or 1⅔
	5

The student must make an average grade of at least C in his last ten courses, and must show such ability to write clear and correct English as to satisfy the Committee on Students' Use of English.

Group III. Leading to the Degree of Bachelor of Science in Medicine

This group is designed for those who can stay only two years in the College of Arts. A student who completes this group and the first two years in the School of Medicine at Galveston will receive the degree of Bachelor of Science in Medicine, to be conferred, according to his preference, either at Austin or at Galveston. Thus the two degrees may be taken in six years.

Freshman Year

English 1	1
Mathematics 1	1
A foreign language, preferably German or French	1

Physics 1 1
Zoology 1 1
Elective ..... ⅓

5⅓

Physical Training.

Sophomore Year:

English 2 or 3 1
The foreign language begun in the freshman year.... 1
Economics 1 or Government 1 1
Chemistry 1 1
*Psychology 101f and Zoology 105w and Zoology 106s; or Zoology 4 1

5

Physical Training (as soon as adequate facilities are provided).

The student must make an average grade of at least C in his sophomore year, and must show such ability to write clear and correct English as to satisfy the Committee on Students' Use of English.

Exemptions

Graduates and students of other colleges who present satisfactory evidence that they have had instruction in any branches taught in the medical curriculum, equivalent in character and extent to that given in this school, may receive exemptions in such subjects by passing examinations with a grade of 75 per cent or more. In applying for exemption in any subject, it is necessary for the applicant to present from his former instructor a letter stating the time spent and ground covered, and also to furnish a catalogue of the college or university from which he comes.

All examinations for exemptions must be taken September 27, 28, and 29, 1917, before the opening of the session.

*Psychology is open to a sophomore only if he completed the freshman year with credit.

Advanced Standing

Students of other medical colleges may be admitted to advanced standing by satisfying the following requirements:

(a) Documentary evidence must be furnished to show that the applicant has had a preliminary education equivalent to that required of the members of the class to which admission is desired.

(b) The applicant must furnish satisfactory evidence of having had didactic and practical laboratory or clinical instruction in the subjects that have been covered by the class which he wishes to enter, equal in character and extent to that given in this school.

(c) Satisfactory examinations, with a grade of 60 per cent or more, must be passed in all such subjects.

(d) A statement of honorable dismissal must be furnished from the medical college last attended.

Examinations for advanced standing will be held September 27, 28, and 29, 1917.

A graduate of a regular medical school seeking a diploma from this institution will be admitted to the graduating class on passing examinations, with a grade of 60 per cent or more, in all subjects taught in the first three sessions of the course in this school. (For the arrangement of the curriculum see pages 23-24.)

A graduate of a regular medical school, not wishing a degree, will be admitted to an elective course in any of the branches of the curriculum upon satisfying the financial requirements.

EXAMINATIONS AND CLASS STANDING

The session is divided into two terms or semesters of fifteen teaching weeks each. Examinations are held at the end of the first term during the last week of January and at the end of the session during the last two weeks of May. For those subjects which are taught throughout the entire session the final examinations cover the work of both terms, but for subjects completed in either term the examination at the end of that term is final. A grade of 60 per cent or more is re-

quired to secure credit for any subject. If a student fails to make 60 per cent in the intermediate examination, he may pass satisfactorily by making 75 per cent in the final examination over the entire subject.

Absence from more than 10 per cent of the teaching exercises in any course of instruction, without satisfactory excuse to the professor in charge or to the dean, makes a student ineligible to the examinations in that subject.

If a student fails to take the examinations at the regular scheduled time, without having been excused by the dean or by the professor in charge, he will be required to repeat the course in that subject.

A student's name may be dropped from the roll at any time during the session, if, in the opinion of the faculty, he is not doing the work of the course in a satisfactory manner.

A student whose grades are unsatisfactory may be conditioned in less than three major subjects. Examinations for the removal of conditions will be held during the last week in September, preceding the next session, and a grade of 75 per cent or more is required in such examinations. Conditions in subjects completed during the first term and which are prerequisite to other courses given during the second term, may be removed by a special examination held during the second week in February. If a student fails to pass a satisfactory examination for the removal of a condition, he will be required to repeat the course, and will not be permitted to take advanced work in any subject in conflict therewith on the roster.

A student is not permitted to carry a deficiency beyond the year succeeding that in which the deficiency occurs. Students with such unsatisfied branches will be matriculated in the class in which the deficiencies occur.

A student conditioned in three or more major branches will not be permitted to take examinations to remove such conditions, but will be required to repeat the year's course in its entirety.

Students who matriculate after the registration days (September 27, 28, 29, and October 1) will be required to pay a delayed registration fee of $3.00.

No regular student will be matriculated after October 15 of any year, except by unanimous consent of the faculty.

No examinations for the removal of deficiencies will be given after October 1 of any year. No student will be permitted to do class work until matriculated.

REQUIREMENTS FOR GRADUATION

Candidates for graduation must be at least twenty-two years of age, and must present evidence of good moral character; they must attend four annual sessions of eight months each and must pass satisfactory examinations in all subjects taught in the senior year; and, after receiving notice of having successfully passed the final examinations of the last session, they must enter their names on the register of candidates for the degree of Doctor of Medicine.

Candidates for graduation must be present and take part in the graduating exercises, unless excused by the dean.

PLAN OF INSTRUCTION

The work of the school is conducted according to the following curriculum:

First Year

Systematic lectures as follows:

Major Subjects: (1) Anatomy (bones, joints, arm, leg, and thorax); (2) biological chemistry; (3) materia medica; (4) normal histology; (5) physiology (digestion, absorption, blood, and respiration).

Minor Subjects: (1) Organic chemistry; (2) embryology; (3) pharmacy.

Practical laboratory work in (1) anatomy; (2) histology; (3) biological chemistry; (4) physiology; (5) materia medica and pharmacy; and (6) embryology.

Second Year

Systematic instruction as follows:

Major Subjects: (1) Anatomy, covering such parts of the subject as are not given in the first year; (2) physiology, cov-

ering those parts of this branch which are not given in the first year; (3) general and special pathology; (4) pharmacology.

Minor Subjects: (1) Physical diagnosis; (2) bacteriology; (3) minor surgery.

Practical laboratory work in (1) anatomy; (2) physiology; (3) pathological histology; (4) pharmacodynamics; (5) bacteriology; (6) physical diagnosis.

Third Year

Systematic lectures in the following:

Major Subjects: (1) Practice of medicine (see pages 37-39); (2) practice of surgery (see pages 42-43); (3) normal obstetrics, including the mechanism and management of labor; (4) therapeutics; (5) special pathology (see page 34); (6) applied anatomy; (7) gynecology (see page 36).

Minor Subjects: (1) Clinical pathology; (2) dermatology; (3) genito-urinary diseases; (4) diseases of the eye; (5) diseases of the ear, nose, and throat.

Practical work in (1) pathology; (2) clinical medicine; (3) clinical pathology; (4) clinical surgery; (5) gynecology; (6) surgical and medical applied anatomy.

Clinical lectures in general surgery, medicine, obstetrics, gynecology, and dermatology.

Fourth Year

Systematic lectures as follows:

Major Subjects: (1) Practice of medicine (see pages 39-41); (2) practice of surgery (see pages 43-44); (3) gynecology (see pages 36-37); (4) obstetrics; (5) pediatrics.

Minor Subjects: (1) Hygiene and preventive medicine; (2) nervous and mental diseases; (3) diseases of the eye; (4) diseases of the ear, nose, and throat; (5) medical jurisprudence.

Practical work in (1) operative surgery; (2) autopsy-making; (3) clinical clerkship, and laboratory of clinical pathology in medicine; (4) clinical clerkship and clinics in surgery; (5) clerical clerkship and clinics in gynecology; (6) cases of labor; (7) outdoor clinics in diseases of the eye, ear, throat, and noce.

Clinical lectures in medicine, surgery, gynecology, pediatrics,

nervous and mental diseases, diseases of the eye, diseases of the ear, nose, and throat.

DEPARTMENTS OF INSTRUCTION

ANATOMY

WILLIAM KEILLER, F. R. C. S. (ED.), *Professor of Anatomy.*
HARRY O. KNIGHT, B. A., M. D., *Associate Professor of Anatomy.*
OTTO JAMES POTTHAST, M. D., *Instructor in Anatomy.*

1. Freshman Course.

Ten hours weekly throughout the session.

(*a*) *Osteology.* Ten hours weekly for six weeks in two periods, two weeks in October and four weeks in January. This course is given in laboratory demonstrations and by quizzes. An excellent museum of osteology consisting of painted and labeled specimens, each carefully described in a special hand-book, affords great assistance to the student.

(*b*) *Arm, Leg, and Thorax.* Ten hours weekly for twenty-two weeks. The class is divided into sections, and demonstration of each region on the cadaver precedes the dissection. The regional method of dissection is followed, Cunningham's *Manual of Practical Anatomy* forming the student's guide.

2. Sophomore Course.

Ten hours weekly throughout the session.

(*a*) *Eye and Ear.* Ten hours weekly for two weeks. These organs are carefully demonstrated by means of specimens, dissections, and models, and afterward are dissected by the students. A complete series of dissections of the eye and ear, each described on a special card, makes these difficult subjects very clear, and gives great assistance in acquiring a practical knowledge of their anatomy.

(*b*) *Brain.* Ten hours weekly for four weeks. The formalin method of preserving the cadaver has revolutionized the study of the brain. The students are furnished with brains in excellent preservation, and each dissection is preceded by a demonstration on a brain before the class in

sections. The nerve tracts are followed by modern methods.

(c) *Head, Neck, and Abdomen.* Ten hours weekly for twenty-two weeks. These parts are dissected by the class in sections, a demonstration of each region on the cadaver preceding the dissection.

(d) *Applied Anatomy.* Two hours weekly for fifteen weeks. The applied anatomy of the extremities is given during the second term of the sophomore year.

3. Junior Course.

One lecture and two laboratory hours weekly throughout the session.

Applied anatomy is taught as a laboratory course, the student dissecting with a special guide-book furnished by the department and designed to present the subject from the standpoint of the clinician and operator.

The anatomical museum is every year becoming a more important feature of the teaching equipment of this department. It contains a large and ever increasing number of wet and dry specimens and wax models. The specimens are not hidden away on the shelves where they are comparatively useless, but each is displayed in such a manner as to be convenient for study, is carefully labeled, and is described in a hand-book which the student is expected to consult. Many loose specimens are also constantly available for the purpose of study.

Dissecting material is abundant and thoroughly preserved, so that dissecting can be carried on with comfort in the warmest weather. The dissecting room is large, airy, well lighted from the roof and sides, always in perfect order, and free from offensive odors.

A reference library containing the more important of the recent text-books and atlases of anatomy is open to students in the anatomical laboratory.

PHYSIOLOGY

WILLIAM SPENCER CARTER, M. D., *Professor of Physiology.*

LAWRENCE EVANS CHAPMAN, B. A., M. D., *Instructor in Physiology and Pharmacodynamics.*

1. *Physiology A.*

Freshman year. Two lectures and four laboratory hours a week for fifteen weeks.

This course covers the physiology of digestion, absorption, the blood and respiration. The laboratory exercises are arranged so that they follow closely upon the lectures and recitations. By frequent cross reference the work of the laboratory is closely correlated with that of the class-room.

Careful consideration is given to the characteristics and composition of the different digestive secretions and the part which each one plays in digestion; the conditions which influence the different phases of digestion, and the activity of the glands concerned in digestion; the movements of the stomach and intestines and all the changes which foods undergo preparatory to absorption; the absorption of foodstuffs, water, crystalloids and colloids from different parts of the alimentary canal; the composition of the blood; methods of estimating the hemoglobin and counting blood corpuscles; hemoglobin compounds, etc.

2. *Physiology B.*

Sophomore year. Five lectures and ten laboratory hours each week for fifteen weeks.

This course includes a thorough consideration of the lymph, circulation, metabolism, nutrition, animal heat, secretions, excretions, nerve, muscle, the central nervous system, and the special senses.

The laboratory is well provided with all the apparatus and facilities for practical work in experimental physiology. For laboratory exercises the class is divided into sections, each section working in two-hour periods five times a week. Two students are assigned to a table having a complete equipment of apparatus after the Harvard models. Most of the experiments are performed by the students themselves under the personal supervision of the professor and instructor, individual instruction being thus insured. The more difficult and complicated experiments are shown by demonstration.

Each student is graded on the practical work in the lab-

oratory, and is required to furnish notes, tabular statements, etc., on every exercise, and also to present tracings when the graphic method is used. The practical instruction by individual work in the laboratory not only enables the student to obtain a better understanding of physiology and to see its relation to other subjects, but it also trains him in experimental methods and better fits him for making individual observations in his medical studies.

The entire ground is covered as evenly as possible, without giving undue prominence to any one part; but those subjects which are especially important to the practicing physician, such as the circulation, metabolism, nutrition, secretions, and excretions, receive most attention.

BIOLOGICAL CHEMISTRY

WILLIAM CUMMING ROSE, B. S., PH. D., *Professor of Biological Chemistry.*

WALTER T. GARBADE, B. S., PH. G., *Adjunct Professor of Chemistry.*

FRANK W. DIMMITT, JR., PH. G., *Fellow in Biological Chemistry.*

HARRY LEIGH BARTLETT, PH. G., *Assistant in Chemistry.*

1. *Organic Chemistry.*

Four lectures per week for fifteen weeks.

This course treats of the fundamental principles and theories of organic chemistry, the general methods of synthesis and purification of organic compounds, with a study of their properties. Special attention is given to compounds which are of importance in medicine. This course is a prerequisite to Biological Chemistry 2.

2. *Biological Chemistry.*

Four lectures and eight laboratory hours a week for fifteen weeks.

The course comprises the chemistry of proteins, fats, and carbohydrates; digestion, intestinal putrefaction, and feces; the analysis of gastric contents, blood, milk, and urine. The students are drilled in quantitative methods—both the analysis of inorganic mixtures, and the separation and estimation of substances of physiological and pathological im

portance. Particular attention is devoted to metabolism. Experiments are made by the students upon themselves, which enable them to learn first-hand the fate of the foodstuffs in the body, and the chemical state of the eliminated end-products.

The latter part of the course consists of the sanitary examination of drinking water, and the detection and separation of the more important inorganic, organic, and alkaloidal poisons.

MATERIA MEDICA AND THERAPEUTICS

EDWARD RANDALL, M. D., *Professor of Materia Medica and Therapeutics.*

RAOUL RENE DANIEL CLINE, PH. G., M. D., *Lecturer on Pharmacy in the School of Medicine.*

LAWRENCE EVANS CHAPMAN, B. A., M. D., *Instructor in Pharmacodynamics.*

1. Materia Medica.

Freshman year. Three lectures or recitations a week for fifteen weeks.

The instruction consists of lectures, recitations, and prescription writing. During one-half of the term, sections of the class are instructed in the laboratory of pharmacy. The time is devoted to practical work, with particular reference to the study and recognition of crude drugs, their chemical incompatibilities, and the manufacture of the more common preparations.

2. Practical Pharmacy.

Freshman year. Two laboratory hours a week for fifteen weeks.

This course is conducted in the laboratory of pharmacy by Professor Cline. It includes a discussion of prescription writing, with special reference to pharmaceutical and therapeutical incompatibilities, and the character and modes of preparation of remedies as far as these bear upon their use in therapeutics. For a full description of this course, see pages 48-49.

3. Pharmacology.

Sophomore year. Two lectures or recitations weekly throughout the session; four laboratory hours a week for fifteen weeks.

This course is devoted to the study of the physiological action of drugs. The individual remedies are considered separately, and their effects upon the normal animal organism are examined in detail. During the second term demonstrations in experimental pharmacodynamics are given in the laboratory. The effects of the most important of the different groups of drugs are shown by administering them to animals, which are always kept under the influence of anesthetics during the experiments. In this way the students become thoroughly acquainted with the effect produced by drugs when given in therapeutic and in poisonous doses.

4. Therapeutics.

Junior year. Two lectures a week throughout the session.

This course is devoted to the study of applied therapeutics. The general conditions under which each drug may be used in the treatment of diseases are pointed out.

HISTOLOGY AND EMBRYOLOGY

MARIE CHARLOTTE SCHAEFER, M. D., *Associate Professor of Histology and Embryology.*

MARGUERITE ICKES, B. A., M. A., *Instructor in Histology and Embryology.*

1. Histology.

Four lectures or recitations and ten laboratory hours weekly during the first term of fifteen weeks; two lectures or recitations and six laboratory hours weekly during the second term (fifteen weeks).

The lecture course includes the systematic study of all tissues and organs.

The laboratory course is closely correlated with the lecture course. The class is divided into two sections. Each

student is provided with a compound microscope and more than two hundred microscopic specimens, which illustrate practically every tissue and organ of the body. The loan collection of slides is constantly being enlarged by the addition of sections of normal human organs. Students are required to make drawings of all tissues and organs studied in the laboratory. Drawings are graded. In the study of the blood each student is required to prepare and stain all of his mounts.

Practical instruction is also given in the technic of fixing, imbedding, sectioning, and staining tissues for microscope examination to those who desire it.

2. *Embryology.*

Two lectures or recitations and four laboratory hours weekly for fifteen weeks.

The didactic course includes a systematic study of cell reproduction; the development of the blastoderm, and a complete, but brief study of the development of each system of organs.

In the laboratory the various phases of development are studied from charts, models, and serial sections. The loan collection available to the students includes specimens illustrating reduction of chomosomes, morula and blastula formation, more than one hundred and fifty whole and serial mounts of chick embryos ranging from the unincubated blastoderm to the age of 96 hours, and several serials of didelphys and pig embryos.

PREVENTIVE MEDICINE

P. W. Covington,* M. D., *Professor of Preventive Medicine.*
Charles Bell McGlumphy, Ph. C., M. D., *Adjunct Professor of Bacteriology.*
Scott Stuart Fay, M. A., M. D., *Instructor in Bacteriology.*

*Absent on leave during the session of 1916-1917.

1. Bacteriology A.

Sophomore year. Two lectures or recitations and fifteen laboratory hours a week for seven and one-half weeks.

In the laboratory special stress is laid upon the development of correct bacteriologic technic. Practical examinations of air, milk, and water are made. Methods of isolation and identification of bacterial species are learned. The biologic characteristics of about thirty species of bacteria, chiefly pathogens, are studied in detail. So far as possible, the pathologic changes caused in the animal body by the more important pathogenic bacteria are demonstrated upon laboratory animals. Practical methods of examination of bacteriologic material from patients and from autopsies and the technic for the isolation of typhoid and dysentery bacilli from the stools of patients and carriers are learned.

2. Bacteriology B.

Sophomore year. Two lectures and four laboratory hours for fifteen weeks.

This course consists in practical work in immunology, serology, and vaccine therapy. It includes the immunization of animals, the production of immune sera, making of vaccines, complement fixation, and agglutination reactions. The principles and methods of disinfection are studied and disinfectants are tested.

3. Hygiene A.

Senior year. Two lectures a week during the first term of fifteen weeks.

The following subjects are considered: vital statistics, communicable diseases and their prevention; disinfection and disinfectants; quarantine; personal hygiene; sanitary control of foods, special emphasis being laid upon the control of public milk supplies; ventilating, lighting, and heating; medical inspection of school children; water and its purification; disposal of sewage and garbage; and public health organization.

4. Hygiene B.

Senior year. Two hours a week during the second term.

This is a continuation of Hygiene A. An attempt is made to combine the principles of a seminar with those of laboratory and field instruction on the various subjects covered in the lectures. Each student is assigned a topic upon which he makes a comprehensive report. The practical instruction in hygiene now included in the laboratory courses in bacteriology, chemistry, and physiology will be supplemented by further work by the student and by demonstrations in the laboratory of preventive medicine. The class will make visits to such places as are of sanitary interest in and near Galveston, such as the various city departments, the incinerator, the state and federal quarantine stations, the Houston sewage disposal plant, etc. Special lecturers will be invited from time to time to address the class on selected topics.

PATHOLOGY

HENRY CHARLES HARTMAN, M. D., *Professor of Pathology.*
MERT HAWKINS STARNES, M. D., *Instructor in Pathology.*
EARL DEAN CRUTCHFIELD, B. A., *Assistant in Pathology.*
BASIL ALEXANDER HAYES, B. A., *Assistant in Pathology.*

1. General and Special Pathology.

Sophomore year. Three lectures or recitations and ten laboratory hours weekly for fifteen weeks.

The subjects covered in the lecture course include the causes of disease, the nomenclature of diseases, parasites, disorders of circulation, disorders of metabolism (both general and local), inflammation, infectious granulomata, tumors, and the special pathology of the circulatory and respiratory systems.

In the laboratory each student examines and makes drawings of about two hundred and fifty typical specimens. The mark of the student's drawing-book is a part of his final grade for the year.

2. *Special Pathology.*

Junior year. Two hours weekly throughout the session. Didactic lectures and recitations upon the special lesions which affect the different organs and systems not covered in the sophomore year. The subjects are the special pathology of the digestive, genito-urinary and nervous systems.

3. *Gross Morbid Anatomy.*

Junior year. Two hours weekly throughout the session. This course naturally falls into two parts. The first includes the methods and criteria of diagnosis from naked-eye inspection of diseased organs, and is illustrated by material derived from autopsies and museum specimens. This work occupies about half the year. The remainder is devoted to complete cases, all the organs being studied, both in the gross and microscopically, the different lesions correlated, and the clinical history reconstructed from the lesions. In this way all the student has learned of normal and pathological anatomy and of symptoms is brought to a focus.

4. *Post-mortem Examinations.*

Methods of autopsy-making are demonstrated to the students of the junior and senior classes, and the seniors are required to take part in practising them by turns. They are also taught how to draw up a correct protocol, with the gross and microscopic findings.

5. *Clinical and Pathological Conferences.*

Senior year. One hour a week throughout the session. In this course the material derived from autopsies is presented to the class jointly by the teaching staffs of the clinical subjects and of the department of pathology for the study of gross specimens and microscoptic sections. In this way the clinical histories and manifestations of disease are reviewed in connection with the study of the pathological conditions found at autopsy.

OBSTETRICS AND GYNECOLOGY

George Henderson Lee, M. D., *Professor of Obstetrics and Gynecology.*

Willard Richardson Cooke, B. A., M. D., *Instructor in Gynecology.*

Jesse Autrey Flautt,* M. D., *Instructor in Obstetrics.*

Benjamin Franklin Smith, Jr., M. D., *Instructor in Obstetrics.*

Ethel Lyon Heard, M. D., *Instructor in Gynecology.*

1. Obstetrics.

Junior year. Two quizzes or lectures and one demonstration weekly throughout the session.

This course is devoted to the study of normal obstetrics, including the anatomy of the pelvis and female organs of generation; the development of the ovum and fetus; the physiology of pregnancy; the mechanism and management of labor; the puerperium and the care of the new-born; twin pregnancy; the surgery of obstetrics. The course is illustrated and made practical by the use of charts, specimens, and manikins.

2. Obstetrics.

Senior year. Two quizzes or lectures weekly throughout the session.

This course includes the study of the pathology of pregnancy; the pathology of labor; dystocia; the deformities of the pelvis; the pathology of the puerperium. Cases of labor are assigned to members of the senior class, under the supervision of the instructor in obstetrics, in the obstetrical wards of the John Sealy Hospital and in the obstetrical outdoor service of the same.

*Resigned February 17, 1917.

GYNECOLOGY

JUNIOR YEAR.

1. Lectures and Clinics.

One lecture and two hours in operative clinics each week throughout the session.

2. Outdoor Clinics.

Six hours weekly for nine weeks. Small sections of the class attend the outdoor clinics in rotation for clinical instruction in the diagnosis and treatment of diseases of women. Each student is assigned a case and required to write the history; also to make the examinations necessary for a diagnosis and carry out the treatment under the direction of the instructor.

SENIOR YEAR.

3. Systematic Lectures.

One lecture weekly throughout the session.

The lectures begun in the junior year are continued throughout the senior year so that the entire field of gynecology is covered in two years.

4. Clinical Clerkships in Gynecological Wards.

Two hours daily for seven weeks. Sections of the senior class in rotation serve as clinical clerks in the gynecological wards. Cases are assigned to students who are required to write the histories, make the necessary examinations and diagnosis, follow out the treatment and assist in any operation that may be necessary.

5. Operative Clinics.

Six hours weekly for seven weeks. In the amphitheatre clinics the various pathological conditions peculiar to women are discussed and operated on. The various plastic operations on the female genitalia are performed and illustrated. The clinical material is abundant and varied.

6. Gynecological Pathology.

One hour weekly throughout the session. The various organs and pathological specimens removed in the operative clinics are gone over with sections of the class in the laboratory of Pathology, where the gross specimens and microscopic sections are studied carefully.

PRACTICE OF MEDICINE

MARVIN LEE GRAVES, M. A., M. D., *Professor of Medicine.*
ALLEN GEORGE HEARD, M. D., *Associate Professor of Pediatrics and Medicine.*
HERBERT LEE MCNEIL, B. A., M. D., *Adjunct Professor of Medicine and Clinical Pathology.*
W. BOYD READING, M. D., *Instructor in Clinical Medicine.*
CHARLES TURNER STONE, B. A., M. D., *Instructor in Clinical Medicine.*
MOISE D. LEVY, M. D., *Instructor in Clinical Pathology.*
LEE RICE, M. D., *Instructor in Clinical Medicine.*

The instruction in the practice of medicine extends throughout the third and fourth years, and is designed to equip the student with a thorough knowledge of the various diseases of internal medicine, including especially modern laboratory and clinical methods of diagnosis and the most practical and approved modes of treatment. Physical diagnosis is taught by practical instruction in the second year (see pages 47-48).

JUNIOR YEAR

1. Systematic Lectures.

Three hours each week throughout the session.

This course covers a large portion of the field of internal medicine and includes the ordinary infectious diseases, diseases of the gastro-intestinal tract and its appendages, respiratory diseases, disorders of the renal, cardiac and circulatory systems and animal parasites.

2. *Out-patient Clinic.*

Six hours weekly for nine weeks.

The junior class is divided into small sections, which attend the out-patient clinics of the John Sealy Hospital from 11 to 1 o'clock daily. As patients are admitted they are assigned to individual students for history-writing and examination. Each student must write a clinical history and make a careful physical examination of the patient under the direction of the instructor. A small pathological laboratory is available for all ordinary examinations of the urine, blood, feces, sputum, etc., of the patients. This work is done in addition to the systematic course in the laboratory of clinical pathology. Junior students are thus given a thorough and practical course of clinical instruction, which is continued in the hospital during their senior year as clinical clerks. All of the work done by students in the dispensary is under the constant supervision of instructors.

3. *Ward Classes.*

Two hours a week for each student throughout the session.

The class is divided into several small sections for careful bedside instruction, and each student receives the personal attention of the teacher in the examination of patients. Quizzes and discussions bring out the salient features of diagnosis, prognosis and treatment.

4. *Clinics.*

Two medical clinics weekly throughout the session.

The entire class is required to attend the medical clinics in which patients with the various internal diseases are exhibited and discussed before the class.

5. *Clinical Pathology.*

Eight hours weekly for ten weeks.

A lecture, recitation and laboratory course is given covering the examination of blood, sputum, urine, feces, gastric contents, exudates and transudates, etc., for clinical purposes. Particular emphasis is placed upon the more practical

and established tests which are relied upon by the clinician. An especial effort is made to familiarize the students with the various forms of blood disorders as well as to acquaint them thoroughly with those diseases which are especially prevalent in the South, such as malaria, animal parasites, abnormalities of the feces, etc.

SENIOR YEAR

6. *Systematic Lectures.*

One hour a week throughout the session.

This course is devoted to those subjects of internal medicine not covered in the junior year. The diseases of metabolism, of the blood and ductless glands, and of the nervous system, and certain other affections not clearly classified are discussed.

7. *Clinical Clerkships in Medical Wards.*

Twelve hours weekly for fifteen weeks.

Senior students in sections become the clinical clerks in the Medical Service of the John Sealy Hospital for one-half of the session. Patients admitted to the wards are promptly assigned to the students in rotation. The student must then take a careful clinical history and make a thorough physical examination, which record becomes a permanent record of the hospital. He must utilize the laboratory for all necessary examinations and be prepared to discuss the cases assigned him either in the ward walks or in the clinic. The roster permits two hours daily to be given to this study of patients by the student, and enables him to have every opportunity to become familiar with his cases. Quizzes are held from time to time and his knowledge of the cases tested. These records are carefully graded by the instructors and due credit given in the final examination.

8. *Clinical Conferences.*

Two hours a week for fifteen weeks.

The medical section is divided into four subsections and each subsection spends two hours weekly with its instructor

in the discussion of clinical cases previously assigned to the clinical clerks. Case histories are criticized, physical examinations reviewed, the diagnosis and treatment thoroughly discussed.

9. *Clinics.*

Two hours weekly throughout the session are devoted to the exhibition and discussion of the clinical cases from the medical wards of the John Sealy Hospital. At these clinics the clinical clerks are required to read the case histories, explain their examinations and give the reasons for their diagnoses and treatment.

10. *Clinical and Pathological Conference.*

One hour weekly throughout the senior year.

Every medical case coming to autopsy is diagnosed clinically by the medical staff before the autopsy takes place. All pathological specimens are removed at autopsy and preserved, to be presented weekly at these conferences conducted jointly by the department of Pathology and the department of Medicine. After the clinical findings and the ante-mortem diagnosis have been discussed by a member of the clinical staff, the pathological report is made and the lesions discussed by the pathologist. Any mistakes which may have occurred in the clinical diagnosis are then discussed by the clinician and the physical signs present as an accompaniment of any given pathological lesions which may have been demonstrated are discussed in detail.

11. *Laboratory of Clinical Medicine.*

(a) Ten hours weekly for fifteen weeks.

The laboratory of clinical medicine is used by senior students during the service as clinical clerks upon the medical division. Each clinical clerk is required to carry out as a routine, complete blood counts and urine analyses upon all patients assigned to him. In addition, he is required to perform any further special diagnostic tests which may be ordered, of which he is capable. The analysis of 24 hour specimens of urine, examination of sputa, stools and gastric

contents, as well as the von Pirquet tuberculin test, the phenolpthalein kidney function test, the administration of vaccines, the examination of spinal fluids, pleural effusion, etc., are all carried out whenever possible by the student himself under the direction, however, of a member of the teaching staff. Students are carefully graded upon their reports on this work, in which promptness and accuracy are especially required. Each clinical clerk, during his medical service in the senior year, averages about twenty assigned cases of his own, so that a fairly varied and comprehensive experience in practical laboratory work is obtained during this time.

(b) Elective course for seniors. Three hours weekly for fifteen weeks.

An elective course in advanced laboratory methods is offered to a limited number of seniors. This course is so designed as to enable each student taking it to familiarize himself thoroughly, by means of actual experience, with the technique of the more difficult methods which are of generally accepted diagnostic or therapeutic value. During this course students learn the Wassermann reaction, the Widal reaction, the technique of making blood cultures, the preparation of vaccines, special methods of examining the blood for total nitrogen, urea and blood sugar, the tests for kidney function and the examination of stools and duodenal contents for pancreatic ferments.

SURGERY

JAMES EDWIN THOMPSON, B. S., M. B. (LOND.), F. R. C. S. (ENG.), F. A. C. S., *Professor of Surgery.*

ALBERT OLIN SINGLETON, B. S., M. D., *Adjunct Professor of Surgery and Lecturer on Genito-urinary Diseases.*

FREDERICK WORLEY AVES, M. D., *Instructor in Surgery.*

VIOLET HANNAH KEILLER, B. A., M. D., *Instructor in Surgical Pathology.*

EARL WILLIAM CLAWATER, M. D., *Instructor in Surgery.*

SOPHOMORE YEAR

1. Bandaging and Minor Surgery.

Two lectures weekly for fifteen weeks.

The course aims at the thorough preparation of the student for the more advanced work of the third and fourth years. It consists of systematic lectures and clinical demonstrations delivered in the hospital. The course covers bandaging and the essentials of asepsis; the preparation of surgical dressings and material; the treatment of surgical injuries such as wounds, burns and scalds, fractures and dislocations; the nature and use of splints and surgical appliances; and the methods of administering anæsthetics.

JUNIOR YEAR

2. Systematic Lectures.

Two hours a week throughout the session.

These lectures cover the following ground: The surgical aspects of inflammation in all its varieties; wounds; local and constitutional infections; gangrene; surgical aspects of tuberculosis and syphilis; fractures; dislocations; diseases of joints; diseases of bones; injuries and diseases of muscles and tendons; injuries and diseases of bursæ; injuries and diseases of the heart and blood-vessels; aneurisms; injuries and diseases of the lymphatic system; injuries and diseases of nerves.

3. Lectures and Demonstrations in Surgical Pathology.

One hour a week during the entire session.

The lectures deal mainly with the pathology of tumors. The demonstrators go over the ground covered in the surgical clinics and are illustrated by gross morbid specimens obtained from the hospitals and from the museum.

4. Out-patient Clinics.

Six hours a week for nine weeks.

The students are assigned cases in the out-patient de-

partment. They are instructed in history taking, prescribing and the practical application of surgical dressings, under the supervision of the chiefs of the surgical outdoor clinic. This department is probably the most valuable training ground in the whole curriculum.

5. *Operative Clinics.*

Six hours a week for twenty weeks.

These clinics are held in the John Sealy Hospital every Monday, Wednesday and Friday from 9 to 11 a. m. Practical instruction will be given in the administration of anæsthetics to the students, who will be called in rotation.

SENIOR YEAR

6. *Systematic Lectures.*

Two hours a week throughout the session.

These lectures cover the following ground: Injuries and diseases of the head, brain, face, neck, spinal column and spinal cord; diseases of the thyroid; diseases of the tongue and mouth, jaws, œsophagus and pharynx; diseases of the stomach and intestines, rectum and anus; diseases of the breast; diseases of the kidneys, ureters and bladder; diseases of the testicles and epididymis; hydrocele; hæmotocele; hernia; intestinal obstruction; diseases of liver and gall-bladder; diseases of the spleen; surgery of the chest and lungs.

7. *Laboratory of Surgical Pathology.*

One hour a week during the entire session.

This course is given to sections of the class in the laboratory of pathology and aims to teach the correlation of the clinical aspects of surgical diseases with their pathologic conditions. The gross and microscopic appearances of diseased tissues and tumors removed in the surgical clinics are studied in connection with a discussion of similar specimens from the museum.

8. Clinical Clerkships in Surgical Wards.

Two hours daily for seven weeks.

Sections of the senior class serve in rotation as clinical clerks in the surgical wards. During this time they take the histories of the patients assigned to them, make all necessary examinations for establishing a diagnosis, make a complete record of the condition of the patient from day to day, both before and after operation, assist in operations on their cases when such are necessary and dress the patients after operations. All of this work is done under the supervision and direction of the teaching staff of the department.

9. Operative Clinics.

Two hours per week throughout the entire session; six hours per week for seven weeks.

During these teaching hours attention is paid especially to advanced teaching and to reviews of final results on cases that have been subjected to operation previously.

10. Operative Surgery on the Cadaver.

Two hours weekly during the entire session.

The course consists of demonstrations on the cadaver. It covers as far as possible the whole ground of the typical and many of the atypical operations. As far as possible each student performs in turn the operations previously described by the teacher. It is the aim of the course to teach operative surgery from a purely anatomical standpoint and the surgical anatomy of each region is taught thoroughly.

11. Elective Course in Advanced Operative Surgery.

This will be open to volunteers from the senior class who show special aptitude for the practice of surgery. The fundamental principles of surgery will be applied to research problems. The hours will be arranged at the opening of the session.

DISEASES OF CHILDREN

ALLEN GEORGE HEARD, M. D., *Associate Professor of Pediatrics.*

Senior year. One lecture and one clinic each week during the first term; two lectures and one clinic weekly during the second term of fifteen weeks.

Clinical instruction in the important diseases of infancy and childhood is given at the John Sealy Hospital during the junior year in the ward classes in clinical medicine. The outdoor clinics also furnish a great variety of cases for this instruction.

During the senior year members of the class in rotation serve as clinical clerks in the children's ward for the study of cases assigned to them. In this way students spend from two to four hours daily in the wards while serving as clinical clerks in the medical service.

OPHTHALMOLOGY AND OTOLOGY

SETH MABRY MORRIS, B. S., M. D., *Professor of Ophthalmology, Otology, Rhinology, and Laryngology.*

WALTER P. BREATH, M. D., *Lecturer on Otology, Rhinology, and Laryngology.*

1. Ophthalmology.

Senior year. One lecture and six clinics weekly throughout the session.

The lectures embrace the following topics: anatomy and physiology of the eye, external diseases, fundus lesions and their relationship to general diseases. The students are given practical instruction in the use of the ophthalmoscope, and are thus afforded every opportunity of acquiring a working knowledge of this instrument.

There are given in the clinics practical demonstrations of the methods of estimating refraction and testing muscular unbalance. Operations are performed before the class.

2. *Otology, Rhinology, and Laryngology.*

Senior year. One lecture and six clinics weekly throughout the session.

The lectures are devoted to the special anatomy and the physiology of the ear, nose, and throat; the methods of examining these parts; and the different diseases to which they are subject.

In the out-patient department, the students have opportunity of acquiring a thorough knowledge of the normal appearance of the parts, and are able to follow the course and treatment of diseased conditions. They receive personal instruction in handling the various instruments used for examination and treatment. Operations are performed before the class.

DERMATOLOGY AND GENITO-URINARY DISEASES

ALBERT OLIN SINGLETON, B. S., M. D., *Lecturer on Dermatology and Genito-urinary Diseases.*

1. *Genito-urinary Diseases.*

Junior year. One hour weekly throughout the session.

A systematic course on this subject is given by lectures during the junior year and instruction is given in the use of the cystoscope and other urological instruments. Operative cases are also presented as they occur in the surgical clinics throughout the third and fourth years. The sugical outdoor clinic furnishes an abundance of cases for teaching this subject in a practical way to the members of the junior class. Patients in the surgical wards are assigned to members of the senior class for history-taking and treatment.

2. *Dermatology.*

Junior year. One lecture each week during the entire session; six hours weekly for nine weeks in outdoor clinics.

The importance to the student of obtaining a thorough knowledge of skin diseases can hardly be overestimated. The frequency with which they are encountered in general practice, and the intimate relations they sustain to diseases

of other organs, make the study both important and interesting. Special attention is given to the common diseases of the skin and to the pathology of the elementary skin lesions. When practicable the lectures are clinical, and when cases are not available, dermochromes are used to illustrate the different forms of disease.

MEDICAL JURISPRUDENCE

DAVID HENRY LAWRENCE,* PH. G., M. D., *Associate Professor of Medical Jurisprudence.*
DICK P. WALL, M. D., *Lecturer on Medical Jurisprudence.*

Senior year. Three lectures a week for fifteen weeks.

This course attempts to cover the subject of legal medicine as follows: The physician's liability for malpractice; relation of physician to patient; medico-legal inspection; violent death; rape; criminal abortion; infanticide; life insurance; malingering; death from the different poisons; corpus delicti; examination of blood stains; hypnotism; and insanity.

It is incumbent upon every physician to have some knowledge of the subject of legal medicine, as every physician, at some time during his professional career, is called upon to give testimony before the courts, and it behooves every young practitioner to appear in court when called upon. He should know, therefore, what the commonwealth expects and has a right to demand of him as a physician, and he should also know his own rights as a medical expert.

PHYSICAL DIAGNOSIS

EDWARD RANDALL, M. D., *Lecturer on Physical Diagnosis.*
ALLEN G. HEARD, M. D., *Instructor in Physical Diagnosis.*
HERBERT LEE MCNEIL, B. A., *Instructor in Physical Diagnosis.*
W. BOYD READING, M. D., *Instructor in Physical Diagnosis.*

Sophomore year. Six hours weekly for seven and one-half weeks.

*Absent on leave during the session of 1916-1917.

This course in physical diagnosis grounds the student in the normal physical signs of the human body. The alterations in these signs in diseased states are also explained and demonstrated. Each student is thus prepared for the clinical studies in the third and fourth years of the curriculum.

The teaching in physical diagnosis is thoroughly practical, and for this purpose the class is divided into small sections, so that each student has the advantage of individual instruction. A brief explanatory talk is given at the beginning of each exercise by the lecturer, the remainder of the time being devoted to the examination of patients in the hospital by the students under the direction of the lecturer and instructors.

PHARMACY

RAOUL RENE DANIEL CLINE, PH. G., M. D., *Lecturer on Pharmacy in the School of Medicine.*

Freshman year. Sections. Two hours weekly for fifteen weeks.

This course is given by practical exercises in the laboratory of pharmacy, and in order that each individual may receive personal instruction and make all the preparations, the class is divided into sections.

The students make those pharmaceutical preparations which are commonly used in the practice of medicine. They are taught how to purify drugs; how to combine them without making them unsightly and unpalatable; how to remove substances which cause irriration and nausea, retard absorption, or impart disagreeable odors. The deterioration of drugs is also carefully considered. In handling the pharmaceuticals and chemicals the students become familiar with the various properties of drugs, their incompatibilities, their solubility in different menstrua, and the best methods of administering them.

The following preparations are made during the course: medicated waters, liquors, elixirs, syrups, spirits, tinctures, pills, tablets, suppositories, collodions, and ointments.

The latter part of the course is devoted to reading and criticising actual prescriptions. Students are required to write prescriptions for hypothetical conditions, special attention being directed to doses, incompatibilities, and the best way of giving the more important drugs in common use. The prescriptions are not only discussed from these standpoints, but it is pointed out how they may be made more palatable and less irritating, and how the unpleasant effects of the drugs may be avoided.

MENTAL AND NERVOUS DISEASES

MARVIN LEE GRAVES, M. A., M. D., *Lecturer on Nervous and Mental Diseases.*

Senior year. One lecture and one clinic weekly throughout the year.

The didactic course covers mental and nervous diseases. At the clinics illustrative cases are presented and discussed. Ample clinical material from the wards and out-patient department of the John Sealy Hospital afford an opportunity for the study of the organic and functional psychoses and neuroses. Cases are assigned to the clinical clerks in the same manner as other patients in the medical service, and history taking and careful physical examinations for permanent record are required of the students. Instruction is given in sensory and motor disorders, normal and abnormal reflexes, trophic disorders, disturbances of the special senses and of speech. Psychoanalysis, the use of electricity and other methods of diagnosis and treatment are utilized. The constantly growing complexity of American life is making the study of the ever increasing diseases of the nervous system more and more necessary to the well trained physician. Fatigue and exhaustion, emotion and emotionalism, with their protean manifestations in the different organs of the body, are carefully studied and efforts made to instruct the student in modern conceptions of psycho-and neuropathology and their morbid manifestations.

SUMMARY OF HOURS DEVOTED TO EACH SUBJECT IN THE SCHOOL OF MEDICINE

	First Year		Second Year		Third Year				Fourth Year				Total				Total for Entire Course
	Lectures and Recitations	Laboratory	Lectures and Recitations	Laboratory	Lectures and Recitations	Laboratory	Clinics	Ward Classes and Dispensary	Lectures and Recitations	Laboratory	Clinics	Clinical Clerkship and Dispensary	Lectures and Recitations	Laboratory	Clinics	Practical Clinical Instruction	
Anatomy		300		300										600			720
Applied Anatomy				30	30	60							30	90			
Physiology	30	60	75	150									105	210			315
Materia Medica	45												45				45
Organic Chemistry	60												60				60
Biological Chemistry	60	120											60	120			180
Histology	90	240											90	240			330
Embryology	30	60											30	60			90
Bacteriology			45	172									45	172			217
Pathology			45	150	60	30				30			105	210			315
Pharmacology			60	60									60	60			120
Therapeutics					60								60				60
Pharmacy		30												30			30
Physical Diagnosis				45										45			45
Hygiene									30				30				30
Medicine					90	80	60	114	30	180	60	180	120	260	120	294	794
Surgery			30		90	30	120	54	60	90	88	84	180	120	208	138	646
Obstetrics					60	30			60				120	30			150
Gynecology					30		60	54	30	30	42	84	60	30	102	138	330
Dermatology					30								30				30
Pediatrics									45		30		45		30		75
Nervous and Mental Diseases									30		30		30		30		60
Ophthalmology					15				15			45	30			45	75
Diseases of the Ear, Nose, and Throat					15				15			45			30	45	75
Medical Jurisprudence									45				45				45
	315	810	255	907	480	230	240	222	330	330	250	438	1380	2277	520	660	4837
	1125		1162		1172				1348								

ISABELLA H. BRACKENRIDGE SCHOLARSHIP

In order to promote professional education among worthy and ambitious women, a scholarship open to women students in the Medical Department of the University of Texas was founded in 1903 by Mr. George W. Brackenridge, of San Antonio, to be known as the Isabella H. Brackenridge Scholarship. The holder is entitled to the sum of $240, payable in installments of $30 at the end of each of the eight months of the scholastic year. This scholarship has been permanently endowed by bonds of the value of $5000, deposited with the state treasurer, the yearly income from these bonds being sufficient for the maintenance of the scholarship.

This scholarship is awarded to that woman of the School of Medicine above the freshman class who shall have attained, in the previous session of the school, the highest general average in the course of study, provided that this general average be not less than eighty-five per cent, and that the grade for the session in any one subject be not less than seventy per cent. When this scholarship is once awarded to any person for any year, such person is entitled to the same for each successive year she is a student in the School of Medicine, provided she maintains the average grades named above. In case the holder shall fall below the average standing of her class, or for any reason shall terminate her connection with the school, the monthly payments shall cease.

This scholarship is awarded at the end of each session to the person designated by the Dean of the Medical Faculty. For the session of 1916-1917, it is held by Jessie Walker Pryor.

BRACKENRIDGE LOAN FUND

With a view to aiding women students who possess ability and seriousness of purpose but who need financial assistance, a loan fund has been established by Mr. George W. Brackenridge, of San Antonio. Of the loans available nine may be held by women students in the School of Medicine. The maximum amount granted to any one person for any session is $240, payable in eight monthly installments. All beneficiaries of the loan fund will be expected to return the amount bor-

rowed as soon as their circumstances permit them to do so. Until repayment of the principal, interest will be charged at the rate of four per cent per annum, payable annually. The loans are made by a committee appointed by the founder of the fund. Applications for loans from this fund should be made to the dean of the Medical Department.

JOHN SEALY HOSPITAL

STAFF

Board of Managers

Dr. Edward Randall, President; Dr. M. L. Graves, Vice-president; John Sealy, A. P. Norman, Dr. H. O. Sappington.
Honorary members: Mr. and Mrs. R. Waverley Smith.

Visiting Staff

Physician and Neurologist.....Dr. Marvin L. Graves
Surgeon.....Dr. J. E. Thompson
Obstetrician and Gynecologist.....Dr. George H. Lee
Pathologist.....Dr. Henry C. Hartman
Dermatologist and Assistant Surgeon.....Dr. A. O. Singleton
Ophthalmologist and Aurist.....Dr. Seth M. Morris
Pediatrist and Assistant Physician.....Dr. Allen G. Heard
Assistant Surgeon.....Dr. F. W. Aves
Assistant Obstetrician.....Dr. B. F. Smith, Jr.
Assistant Gynecologist.....Dr. W. R. Cooke
Assistant Physician.....Dr. H. L. McNeil
Assistant Physician.....Dr. W. Boyd Reading
Assistant Physician and Registrar.....Dr. C. T. Stone
Assistant Gynecologist.....Dr. Ethel Lyon Heard
Assistant Physician.....Dr. Lee Rice
Assistant Surgeon.....Dr. E. W. Clawater

Superintendent

Clara Lincoln Shackford

Resident Staff

Paul H. Streit, M. D.
W. J. C. Weimers, M. D.
J. L. Jinkins, M. D.
D. H. Mebane, M. D.
R. K. Simpson, M. D.
E. D. Mills, M. D.
F. H. Hodde, M. D.

Clinical Pathologist

Moise D. Levy, M. D.

Roentgenologist

A. S. Holley, M. D.

Staff for Outdoor Clinics

Chief of the Surgical Clinic.....Dr. F. W. Aves
Assistant in the Surgical Clinic.....Dr. E. W. Clawater
Chief of the Medical Clinic.....Dr. W. Boyd Reading
Assistants in the Medical Clinic..... { Dr. H. L. McNeil / Dr. E. Lee Rice
Chief of Obstetrical and Gynecological Clinic..Dr. W. R. Cooke
Assistants in Obstetrical and Gynecological Clinic..... { Dr. B. F. Smith, Jr. / Dr. Ethel Lyon-Heard
Chief of the Pediatric Clinic.....Dr. Allen G. Heard
Chief of the Clinic of Opthalmology.....Dr. S. M. Morris
Chief of Ear, Nose and Throat Clinic.....Dr. W. P. Breath

Apothecary

W. E. Huddleston

Superintendent of School of Nursing

Ethel D'Arcy Clay, R. N.

HISTORY AND DESCRIPTION

"It being represented to the citizens of Galveston, and to the people of the state of Texas, that John Sealy, late of the city of Galveston, departed this life in the month of August, 1884, inspired with a generous and philanthropic motive and possessed of a large real and personal estate, of which by his bequest he devoted $75,000 to the establishment of a hospital in said city, naming for the purpose the city council of the city of Galveston and the regents of the University of Texas, jointly, for and in behalf of the Medical Department of said University, to manage and conduct the same for the reception and relief of sick and diseased persons; the property of said hospital shall be exempt from taxation, and shall be entitled to the benefits and provisions of the law relative to charitable institutions.

"The regents may take and hold any additional donations, grants, devices, and bequests in further support of, or addition to, said hospital.

"The direction, ownership, and disposition of said hospital shall be vested in said regents and their successors, for the object and purposes heretofore set forth, and pursuant to the wishes and directions of the last will and testament of its founder aforesaid."

The John Sealy Hospital, comprising a group of five buildings in addition to the main building, occupies a block of ground between Eighth and Ninth Streets, and between Avenues A and B, contiguous to the block occupied by the College Building.

In addition to the original bequest for the foundation of the hospital, the heirs of the late John Sealy had very generously contributed for its repair and improvement a sum aggregating more than $180,000 prior to 1914. In 1914 they erected and finished at a cost of $125,000 a new four-story fireproof building, about one-half of the size of the main hospital, which provides additional wards for women patients. This has increased the number of patients considerably, and affords better facilities for clinical teaching.

The entire institution, including the Nurses' Home and the five hospital buildings, is heated by steam and lighted by elec-

tricity. The wards and rooms are large and airy, having been built with special reference to the comfort of the sick in the prevailing warm seasons of this climate.

The upper floor of the central part of the main hospital building is occupied by a clinical theater, together with a sterilizing room, preparation rooms, dressing rooms, etc. Clinics are held here every week day throughout the session.

During the years 1915-16 the original main building was completely remodeled by Mr. John Sealy at a cost of $275,000. Every part of the hospital was reconstructed and many improvements were made. The clinical amphitheatre was greatly improved and an additional operating room provided: splendidly equipped laboratories of roentgenology and clinical pathology adjoin the operating rooms: the space for outdoor clinics was enlarged and rearranged. A fourth story has been added to the building thus increasing the capacity of the hospital by the addition of two wards and several rooms for private patients. This building now has 110 beds in five wards and seventeen private rooms.

A two-story brick building, accommodating sixty beds, in two large wards, with several private rooms, has been erected on the north side of the hospital lot for the accommodation of colored patients. This building was completed in 1901, and its construction was made possible by a public benefaction amounting to $18,500.

On the west side of the block occupied by the hospital a reinforced concrete building has been erected for children. This building has two commodious wards with wide galleries and several private rooms. It provides all the necessary hospital accommodations for the care of thirty-eight children.

The University has acquired for hospital purposes all the ground intervening between the original hospital block and the sea-wall. On the extreme north end of this plot of ground a substantial building of reinforced concrete has been constructed as an isolation pavilion for contagious diseases. This building provides suitable accommodations for twenty-five or more patients, with facilities for isolating by sexes, races, and diseases.

A new four-story building has recently been erected to the east of the main hospital by Mrs. R. Waverley Smith and her brother, Mr. John Sealy. This building provides fifty-six beds

in seven wards for women patients, ten private rooms, and an operating room.

The University has recently completed a new three-story, fireproof home to accommodate sixty-four nurses. This building has been named the Rebecca Sealy Nurses' Home in recognition of Mrs. Rebecca Sealy's interest and generosity in establishing and maintaining the training school for nurses before this became the School of Nursing of the University.

The hospital is leased to the city of Galveston for a period of twenty-five years by the University of Texas at a nominal rental, with the agreement that the visiting staff to the hospital shall be designated by the regents of the University from the medical faculty. The lease provides that the John Sealy Hospital is to be used as a medical college hospital in connection with the Medical Department of the University of Texas, and that the wards, clinics, theater, etc., of the institution are to be used by the staff for giving clinical instruction to medical students.

The city of Galveston maintains the John Sealy Hospital as a city hospital for the free treatment of the indigent sick and disabled, by an annual appropriation of $40,000. The income derived from private rooms is an additional source of revenue.

There are few hospitals in which the patients can be utilized so fully for bedside and clinical instruction as in the John Sealy Hospital. The only limitations are the welfare and comfort of the patients. Without detracting in any way from the benefits derived by the patients from hospital treatment, the students are enabled to profit by the very exceptional clinical advantages.

The hospital has 286 beds in public wards and 30 in private rooms. During the year 1916 there were 3621 patients treated in the hospital, the average number of indoor patients for each day during the year being 209. In the dispensaries, or outdoor clinics, there were 6849 new cases and 8939 old cases; the average number of outdoor patients treated each day was 52.

The resident staff of the hospital is appointed annually from the graduating class. The nursing is done by the students of the School of Nursing under the direction of the instructor in nursing.

Galveston is the foremost port in this country for the exportation of cotton, and is one of the most important seaport cities of the Southern states. Her shipping interests, already large, are growing rapidly. With this growth the number of hospital cases available for teaching purposes has increased correspondingly. For 1901 the average daily number of indoor patients in the John Sealy Hospital was 49; for 1905, the average number of patients for each day was 98; for the years 1914 to 1916, inclusive, the average daily number of indoor patients was 166, 186, and 209, respectively.

The character of the population from which the hospital wards are filled assures a great variety of medical affections, while the numerous railroad and steamship lines which converge at this point furnish an abundance of surgical cases.

The work of the hospital has increased so rapidly in the last few years that it is impossible to give here a detailed statement of the diseases treated in the various departments.

The following condensed report of the number of patients treated in the indoor and outdoor departments of the hospital and the number of operations performed from January 1, 1916, to January 1, 1917, will serve to show the excellent opportunities for clinical teaching in this school.

SUMMARY OF PATIENTS TREATED IN JOHN SEALY HOSPITAL FOR 1916

Total number of patients in medical service	1,002
Total number of patients in mental and nervous service	118
Total number of patients in pediatric service	200
Total number of patients in surgical service	1,045
Total number of patients in gynecological service	437
Total number of patients in obstetrical service	206
Total number of babies born in the hospital	131
Total number of patients in eye, ear, nose and throat service	161
Total patients in Marine Hospital Division of U. S. Public Health Service	321
Total number indoor patients in hospital	3,621
Total number of hospital days	76,308
Average number of hospital days for each patient	21
Average number of daily indoor patients in hospital	209
Total number of patients treated in outdoor clinic	6,849
Total consultations in outdoor clinics	15,788
Average daily number of patients in outdoor clinics	52
Number of patients delivered in outdoor obstetrical service	13
Number of patients delivered in indoor obstetrical service	133
Total number of patients operated upon in surgical service	638
Total number of patients operated upon in gynecological service and obstetrical service	458
Total number of patients operated upon in eye, ear, nose and throat service	163
Total number of deaths in all services	232
Total number of autopsies held	96
Total number of examinations made by Laboratory of Clinical Pathology	4,336

SUMMARY OF OUTDOOR CLINICS

Service	New Cases	Old Cases	Total
Medical	2327	1768	4095
Pediatric	850	665	1515
Surgical	1790	4434	6224
Gynecological	969	607	1576
Special	913	1465	2378
Total	6849	8939	15788

ROSTER OF THE SCHOOL OF MEDICINE, 1917-1918

FRESHMAN CLASS: FIRST TERM

Hour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8 a. m.	Histology	Histology	Histology	Histology		
9 a. m. 10 a. m.	Anatomy A Histology B	Anatomy A Histology B	Anatomy A Histology B	Anatomy A Histology B	Anatomy A Histology B	
11 a. m. 12 m.	Anatomy B Histology A	Anatomy B Histology A	Anatomy B Histology A	Anatomy B Histology A	Anatomy B Histology A	Laboratory of Pharmacy
2 p. m.					Laboratory of Pharmacy	
3 p. m.	Organic Chemistry	Organic Chemistry	Organic Chemistry	Organic Chemistry		
4 p. m.			Materia Medica	Materia Medica	Materia Medica	
5 p. m.						

ROSTER OF THE SCHOOL OF MEDICINE, 1917-1918

FRESHMAN CLASS: SECOND TERM

Hour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8 a. m.	Histology	Histology	Embryology	Embryology		
9 a. m. 10 a. m.	Anatomy A Histology B	Anatomy A Histology B	Anatomy A Embryology B	Anatomy A Embryology B	Anatomy A Histology B	Laboratory of Biological Chemistry
11 a. m. 12 m.	Anatomy B Histology A	Anatomy B Histology A	Anatomy B Embryology A	Anatomy B Embryology A	Anatomy B Histology A	
2 p. m. 3 p. m.	Laboratory of Physiology	Laboratory of Physiology	Laboratory of Biological Chemistry	Laboratory of Biological Chemistry	Laboratory of Biological Chemistry	
4 p. m.	Physiology	Physiology	Biological Chemistry	Biological Chemistry	Biological Chemistry	
5 p. m.		Biological Chemistry				

ROSTER OF THE SCHOOL OF MEDICINE, 1917-1918

SOPHOMORE CLASS: FIRST TERM

Hour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9 a. m. 10 a. m.	Anatomy A Physiology B	Anatomy A Physiology B	Anatomy A Physiology B	Anatomy A Physiology B	Anatomy A Physiology B	Bacteriology
11 a. m. 12 m.	Anatomy B Physiology A	Anatomy B Physiology A	Anatomy B Physiology A	Anatomy B Physiology A	Anatomy B Physiology A	Bacteriology (seven weeks for each section)
2 p. m. 3 p. m.	Bacteriology (7 weeks)	Bacteriology (7 weeks)	Physical Diagnosis (2-4 p. m.) Bacteriology (7 weeks each)	Physical Diagnosis (2-4 p. m.) Bacteriology (7 weeks each)	Physical Diagnosis (2-4 p. m.) Bacteriology (7 weeks each)	
4 p. m.	Therapeutics	Therapeutics	Physiology			
5 p. m.	Physiology	Physiology	Bacteriology	Physiology	Physiology	

ROSTER OF THE SCHOOL OF MEDICINE, 1917-1918

SOPHOMORE CLASS: SECOND TERM

Hour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9 a. m. 10 a. m.	Anatomy A Pathology B	Anatomy A Pathology B	Anatomy A Pathology B	Anatomy A Pathology B	Anatomy A Pathology B	
11 a. m. 12 m.	Anatomy B Pathology A	Anatomy B Pathology A	Anatomy B Pathology A	Anatomy B Pathology A	Anatomy B Pathology A	Bacteriology B Pharmacodynamics A
2 p. m. 3 p. m.	Bacteriology B Applied Anatomy A	Bacteriology A Applied Anatomy B	Bacteriology A Pharmacodynamics B	Bacteriology A Pharmacodynamics B	Bacteriology B Pharmacodynamics A	
4 p. m.	Therapeutics	Therapeutics	Minor Surgery	Pathology	Minor Surgery	
5 p. m.	Bacteriology	Pathology	Pathology	Bacteriology		

ROSTER OF THE SCHOOL OF MEDICINE, 1917-1918

JUNIOR CLASS

Hour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8 a. m.	Ophthalmology	Lab. of Pathology, first term	Otology	Dermatology	Surgical Anatomy	Clinical Pathology (one section)
9 a. m.	Clinical Pathology (one section)	Medical Clinic	Clinical Pathology (one section)	Medical Clinic	Clinical Pathology (one section)	Pediatric Clinic (two sections)
10 a. m.	Surgical Clinic (two sections)	Gynecological Clinic	Surgical Clinic (two sections)	Gynecological Clinic	Surgical Clinic (two sections)	Surgical Pathology
11 a. m.	Outdoor	Outdoor	Outdoor	Outdoor	Outdoor	Outdoor
12 m.	Clinics	Clinics	Clinics	Clinics	Clinics	Clinics
2 p. m.	Medical Ward Class	Medicine	Lab. of Pathology, first term	Medical Ward Class	Surgical Anatomy	
3 p. m.	Medicine	Surgery	Medicine	Surgery		
4 p. m.	Therapeutics	Therapeutics	Pathology	Genito-Urinary Diseases	Demonstration in Obstetrics	
5 p. m.	Pathology		Obstetrics	Obstetrics	Gynecology	

ROSTER OF THE SCHOOL OF MEDICINE, 1917-1918

SENIOR CLASS

Hour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8 a. m.	Ophthalmology	Medical Jurisprudence, first term, Pediatrics, second term	Otology	Hygiene	Surgical Pathology C and D	Surgical Pathology A and B
9 a. m.	Case taking: Medical ward, 2 sections; Gynecology, 1 section	Medical Clinic	Surgical Clinic	Medical Clinic	Surgical Clinic	Pediatric Clinic
10 a. m.	Surgical Clinic, 1 section	Gynecological Clinic 1 section; Case taking: Medicine, 2 sections; Surgery, 1 section;	Case taking: Medicine, 2 sections; Surgery, 1 section; Gynecology, 1 section;	Case taking: Medicine, 2 sections; Surgery, 1 section; Gynecology, 1 section. Experimental Surgery (elective)	Case taking: Medicine, 2 sections; Gynecology, 1 section. Surgery, 1 section.	Gynecological Clinic, 1 section. Case taking: Medicine, 2 sections; Surgery, 1 section
11 a. m.	Nervous and Mental Diseases					
12 m.	Hygiene	Laboratory of Clinical Pathology: Sections A and B first term; Sections C and D second term;			Medicine	
2 p. m.		Clinics in Ophthalmology and Otology: Sections C and D first term; Sections A and B second term. Laboratory of Clinical Pathology: Sections A and B first term; Sections C and D second term.				
3 p. m.	Pediatrics	Gynecological Pathology	Experimental Surgery (elective)	Nervous and Mental Diseases Clinic	Operative Surgery	
4 p. m.	Clinico-Pathological Conference	Surgery	Clinical Pathology (elective)	Surgery		
5 p. m.	Obstetrics	Obstetrics	Medical Jurisprudence first term	Medical Jurisprudence first term	Gynecology	

SCHOOL OF MEDICINE: SPECIAL ROSTER FOR CLASS SECTIONS, 1917-1918

SOPHOMORE CLASS: The following special roster will be followed for laboratory exercises not shown by the major roster:

SECTION A			SECTION B		
Bacteriology	Physical Diagnosis	Pharmaco-dynamics	Bacteriology	Physical Diagnosis	Pharmaco-dynamics
Oct. 2 to Nov. 24, 1917. Feb. 4 to May 15, 1918.	Tues., Wed. and Fri., 2-4 p. m. Nov. 26, 1917, to Jan. 26, 1918	Friday and Sat., Feb. 4 to May 15, 1918.	Nov. 26, 1917, to Jan. 26, 1918. Feb. 4 to May 15, 1918.	Tues., Wed., and Fri., Oct. 2, to Nov. 24, 1917	Wed. and Thurs., Feb. 4 to May 15, 1918

JUNIOR CLASS: Two sections spend one-third of the session in the laboratory of Clinical Pathology. Each section attends the different outdoor clinics for two hours on three days per week as follows:

DEPARTMENT	October 2, to Dec. 8, 1917	Dec. 10, 1917, to Mar. 2, 1918	March 4 to May 11, 1918
Lab. of Clinical Pathology: Mon., Wed., Fri. and Sat.	A and B	C and D	E and F
Medical Outdoor Clinic: Mon., Wed. and Fri.	A	C	E
Tues., Thurs. and Sat.	B	D	F
Surgical Outdoor Clinic: Mon., Wed. and Fri.	C	E	A
Tues., Thurs. and Sat.	D	F	B
Gynecological Outdoor Clinic: Mon., Wed. and Fri.	E	A	C
Tues., Thurs. and Sat.	F	B	D

SENIOR CLASS: Sections spend two hours daily in case-taking in the different wards as follows:

	Oct. 2 to Nov. 24, 1917	Nov. 26 to Jan. 26, 1918	Feb. 4 to March 23, 1918	March 25 to May 10, 1918
Medical Wards	A and B	A and B	C and D	C and D
Surgical Wards	C	D	A	B
Gynecological Wards	D	C	B	A
Special Outdoor Clinics	C and D	C and D	A and B	A and B

TEXT-BOOKS

First Year

Anatomy: Cunningham's *Text-book of Anatomy* ($6.00); Cunningham's *Manual of Anatomy* ($7.50).

Physiology: Howell's *Text-book* ($4.00); Stewart's *Manual of Physiology* (7th ed.) ($4.00); Beddard, Elkins, Hill, Macleod, and Pembrey's *Practical Physiology* ($5.00).

Materia Medica and Therapeutics: Cushny's *Pharmacology and Therapeutics* ($3.75); Bastedo's *Materia Medica, Pharmacology, and Therapeutics* ($3.50); *United States Pharmacopeia* ($2.50); Thornton's *Prescription Writing* ($1.25).

Chemistry: Hammersten's *Physiological Chemistry*, translated by Mandel ($4.00); Remsen's *Organic Chemistry* ($1.20); Hawk's *Practical Physiological Chemistry* ($2.50); Autenrieth and Warren's *Detection of Poisons* ($2.00).

Histology: Piersol ($3.50); Böhm, Davidhoff, and Huber ($3.50); Jordan and Ferguson ($4.00); Bailey ($3.00); Schäfer ($7.50).

Lexicon: Gould's *Practitioners'* ($2.75); Dorland ($4.50); Thomas ($3.00); Gould's *Illustrated* ($10.00).

Embryology: Bailey and Miller ($4.75); Prentis ($3.75); Kellicott ($2.50); Heisler ($2.50).

Second Year

Anatomy: Same as above.

Physiology: Howell ($4.00); Stewart ($5.00); Tigerstedt ($4.00); Ott ($3.00); Starling ($5.00); Lusk's *The Science of Nutrition* ($1.75); Beddard's *Practical Physiology* ($5.00).

Therapeutics: Same as in first year.

Surgery: Wharton's *Manual of Minor Surgery* ($3.00).

Pathology: Adami's *General Pathology* ($6.00); MacCallum's *Textbook of Pathology* ($7.50); Mallory's *Pathologic Histology* ($5.50); Mallory and Wright's *Pathologic Technique* ($3.00).

Bacteriology: Park and Williams' *Pathogenic Microorganisms* ($4.00); Hiss and Zinsser's *Bacteriology* ($3.75); Jordan's *General Bacteriology* ($3.00); McFarland's *Pathogenic Bacteria and Protozoa* ($3.50); Citron's *Immunity* ($3.50); Kolmer's

Infection, Immunity, and Specific Therapy ($6.00); Ricketts and Dick's *Infection, Immunity and Serum Therapy* ($2.00).

Lexicon: Same as in first year.

Third and Fourth Years

Anatomy: Treves's *Surgical Applied Anatomy* ($2.00); Davis's *Applied Anatomy* ($6.00).

Therapeutics: Cushing ($3.75); Bastedo ($3.50); Hare's *Practical Therapeutics.*

Dietetics: Hutchison ($5.00); Yeo ($2.50); Thompson ($5.00).

Practice of Medicine: Osler ($5.50); Tyson & Fussell (6th ed.) ($5.50); Anders ($5.50); Manson's *Tropical Diseases* ($5.00); McKenzie's *Diseases of the Heart* ($9.00); Kemp's *Diseases of the Stomach, Intestines and Pancreas* ($6.50); Cabot's *Physical Diagnosis* ($2.50); Butler's *Diagnostics of Internal Medicine* ($6.00); Musser's *Medical Diagnosis* ($6.50); DaCosta's *Physical Diagnosis* ($3.50); Emerson's *Clinical Diagnosis* ($5.00); Wood's *Chemical and Microscopical Diagnoses;* Simon's *Clinical Diagnosis* ($4.00); Webster's *Diagnostic Methods* ($4.50); Thomas Lewis' *Clinical Diseases of the Heart Beat* ($2.00); Todd's *Clinical Diagnosis* ($2.50); Braker, Hewlett and others, *Monographic Medicine* (6 vol., $37.00).

Surgery: Rose and Carless' *Manual of Surgery* ($5.00); DaCosta's *Modern Surgery* ($5.00); Treves' *Student's Handbook of Surgical Operations* ($2.50); Binnie's *Operative Surgery* ($7.00); Bowlby's *Surgical Pathology* ($2.00); Mummery's *The After-treatment of Surgical Operations* ($2.00).

Gynecology: Findley ($6.00); Crossen ($6.00); Ashton ($6.00); Graves ($6.00); Montgomery ($6.00); Kelly ($15.00).

Obstetrics: Williams's *Obstetrics* ($6.00); De Lee's *Obstetrics* ($8.00); Edgar's *Practice of Obstetrics* ($6.00); Cragin's *Obstetrics* ($6.00).

Pathology: MacCallum'c *Textbook of Pathology* ($7.50); Adami's *Special Pathology* (6.00).

Nervous and Mental Diseases: Church and Peterson's *Nervous and Mental Diseases* ($5.00); Kraeplin's *Clinical Psychiatry* ($3.50); Starr's *Organic and Functional Nervous Diseases* ($6.00); Collins' *Treatment of Nervous Diseases* ($5.00); Jeliffe and White ($12.00).

Diseases of Children: Holt's *Diseases of Infancy and Childhood* ($6.00); Chapin and Pisek's *Diseases of Infants and Children* ($5.50); Kerley's *Practice of Pediatrics* ($5.00); Koplik's *Diseases of Infancy and Childhood* ($5.00).

Diseases of the Skin: Stelwagon (4th ed.) ($6.00); Sutton ($6.00); Pusey ($6.00); Schamberg ($3.00); Jackson ($2.75); Walker ($3.00); Shoemaker ($5.00); Croker ($5.00); Jamison ($6.00); MacLeod's *Pathology of the Skin* ($3.75).

Venereal Diseases: Chetwood ($6.00); Keyes ($6.00); Hayden ($1.75); Lydston ($5.00); Morton ($3.00).

Ophthalmology: De Schweinitz's *Diseases of the Eye* ($5.00); Fox's *Ophthalmology* ($6.00).

Diseases of Ear, Nose, and Throat: Gleason ($2.50); Bosworth's *Diseases of the Nose and Throat* ($4.50).

Medical Jurisprudence: Reese ($3.00); Taylor ($4.50); Peterson and Haines's *Legal Medicine and Toxicology*, 2 vols. ($5.00 each).

Hygiene: Rosenau's *Preventive Medicine and Hygiene* ($6.00); Bergey ($3.00); Harrington and Richardson's *Practical Hygiene* ($5.00); Chapin's *The Sources and Modes of Infection* ($3.00).

Lexicon: Same as in the first year.

NOTE.—In the above list of text-books the price noted in parenthesis is that of the cheapest named edition in each case, as a rule bound in cloth. In each case only the latest edition should be purchased. Sheep binding will cost about fifty cents or a dollar more than the price quoted. The student is urged to procure for himself at least one text-book upon each subject. In some instances choice between several authors is left with the student; in such cases the work preferred is usually named first.

DEGREES

At the commencement exercises held at the completion of the twenty-fifth regular session, May 31, 1916, thirty-five candidates were granted the degree of Doctor of Medicine as follows:

Thelbert Forney Bunkley	Hugh Jefferson Davis
Howard Marion Bush	Ruby Kathleen Embry
William Henry Cade	Elmo Dial French
Albert Nicholas Champion	Roy Green Giles

Thomas William Glass
Thomas Wade Hedrick, Jr.
Frederick Henry Hodde
William Lee Hudson
Julius Luther Jinkins
Robert Lee Kurth
John Edens Lattimore
Seth Anderson McConnell
Herbert Chamberlain Maxwell
Douglas Hamilton Mebane
Edmund Dumas Mills
John William Pittman
Marshall A. Ramsdell
Estill Lee Rice
Aaron Lamar Roberts
Lieuen Moss Rogers
Edwin Grover Schwarz
Bradford Ripley Alden Scott
Robert Keith Simpson
Mert Hawkins Starnes
Edwin Marion Frank Stephens
Jamie D. Stephens
Paul Henry Streit
Douglas Randolph Venable
John Lively White
Wesley J. C. Wiemers
Robert Frederick Zeiss

HOSPITAL APPOINTMENTS

A year of residence in a hospital after graduation in medicine is recognized as a very important part of the preparation for the practice of medicine. Three states (Pennsylvania, New Jersey, and Rhode Island) now require a hospital internship of one year of all applicants for the license to practise medicine and it is highly probable that other state boards of medical examiners will have a similar requirement in the near future.

Hospital interns receive their board, laundry, and lodging free, and enjoy superior advantages for acquiring practical experience in the different departments of medicine and surgery.

The John Sealy Hospital belongs to the University of Texas and is the teaching hospital of the Medical Department. It is in every way a university hospital and offers all the advantages of an institution devoted to clinical instruction and research. It has 286 beds in the public wards and thirty rooms for private patients, affording an abundance and a great variety of clinical material.

Ten members of each graduating class are awarded internships in the John Sealy Hospital for one year on their scholarship standing, based upon the general averages for the junior year. These internships are most desirable as exceptional opportunities are given for a broad clinical training in the care of a great variety of diseases in a subtropical seaport, which are thoroughly studied for teaching purposes.

Internships in certain other hospitals in Texas and in other states are awarded on scholarship standing, personal fitness, and in some instances by special appointment.

A limited number of internships in the Cleveland City Hospital is open to members of the graduating class by special competitive examinations conducted in the medical college by the authorities of these hospitals.

The following members of the class which graduated in 1916 have been appointed interns in the hospitals named:

John Sealy Hospital

Paul H. Streit
W. J. C. Wiemers
J. L. Jinkins
D. H. Mebane
R. K. Simpson
E. D. Mills
F. H. Hodde

St. Mary's Infirmary

J. W. Pittman
J. D. Stephens
E. M. F. Stephens

Santa Rosa Infirmary, San Antonio

H. M. Bush
R. G. Giles

St. Joseph's Infirmary, Houston

J. L. White

Philadelphia General Hospital

R. L. Kurth
L. M. Rogers

Cleveland City Hospital

D. R. Venable
A. N. Champion
E. G. Schwarz

Providence Sanitarium, Waco.

John E. Lattimore

St. Louis City Hospital, St. Louis, Mo.

Hugh J. Davis

New York Infirmary for Women and Children.

Ruby K. Embry

Willard Parker Hospital, New York.
T. W. Glass

St. Luke's Hospital, Jacksonville, Fla.
E. D. French

ASSOCIATIONS

Alumni Associations

The Alumni Association of the Medical Department of the University of Texas, as a branch of the General Alumni Association of the University, has been in existence for a number of years, and has as its object the consideration and active prosecution of plans for the betterment of the school in such ways as the alumni are able to devise. It is open to the graduates of any of the schools of the Medical Department. It meets twice a year, once during the last week of the college session, upon a date assigned by its officers, and once during the annual meeting of the State Medical Association.

Students' Association

The Students' Association is an organization of the students of the institution, having as its object the mutual betterment of its members and the consideration and prosecution of such school matters as may properly be undertaken by the student body. Under its auspices is published *The University Medical*, a monthly medical journal, and it is likewise the basis of organization of such bodies as the Students' Co-operative Book Store and the University Dining Club, although these in their special activities act independently of the parent society.

Young Men's Christian Association

The Y. M. C. A. conducts devotional services every Sunday afternoon during the session. Its object is to better the religious life of the student body. From time to time prominent men from the city are invited to address the meetings.

EXPENSES

Fees

Each student on entering the Department of Medicine is required to pay a matriculation fee of thirty dollars. This fee is paid but once, and is not required after the first term of attendance. If it has been paid in any other department of the University, it is not again required in the Medical Department. Other fees are in the nature of laboratory fees, to pay for material used by the student in laboratory exercises, or deposits to cover damage to laboratories or the library.

Instead of making separate deposits for each of the laboratories, one general deposit will be required each year to cover all loss, breakage, or damage to apparatus, books, or other equipment of the institution. These deposits are intended to cover the value of apparatus entrusted to each student in the laboratories, or of books withdrawn by the student from the library. At the close of the session, on return of apparatus in good condition, these deposits are returned to the student. Articles of apparatus or books not thus returned are charged against the deposit, their cost to the institution deducted therefrom, and the balance returned to the student. When the value of such broken or unreturned property of the school is greater than the deposit, a special charge is made to replace the article in question.

A library fee of one dollar will be deducted from the library deposit made by each student at the beginning of the session. This will be used to cover the expense of wear and tear of the books and for binding journals, books, etc.

A hospital fee of $2.25 is required at the time of matriculation for each year. These fees constitute the Students' Hospital Fund which is used to defray the necessary expenses for the care of students in the hospital in case of illness.

Students who matriculate after the registration days (September 27, 28, 29, and October 1, 1917), will be required to pay a delayed registration fee of $3.00

The following list of expenses will indicate the items and total payments required each year, the items of deposit being returnable from the annual total, in accordance with the above explanation:

FIRST YEAR

Matriculation fee (payable once only)		$30.00
Laboratory fee in chemistry	$ 5.00	
Laboratory fee in physiology	5.00	
Laboratory fee in anatomy	10.00	
Laboratory fee in histology	5.00	
Laboratory fee in pharmacy	5.00	
Hospital fee	2.25	
Total laboratory fees		32.25
Deposit for library, laboratories, etc. (returnable as explained above)		15.00
Total payment upon matriculation		$77.25

SECOND YEAR

Laboratory fee in pathology	$ 5.00	
Laboratory fee in physiology	5.00	
Laboratory fee in anatomy	10.00	
Laboratory fee in bacteriology	5.00	
Hospital fee	2.25	
Total laboratory fees		27.25
Deposit for library, laboratories, etc. (returnable as explained above)		20.00
Total payment upon matriculation		$47.25

THIRD YEAR

Laboratory fee in clinical medicine	$ 5.00	
Laboratory fee in pathology	5.00	
Laboratory fee in surgical anatomy	5.00	
Hospital fee	2.25	
Total laboratory fees		17.25
Deposit for library, laboratories, etc. (returnable as explained above)		12.50
Total payment upon matriculation		$29.75

FOURTH YEAR

Laboratory fee in operative surgery	$ 5.00	
Laboratory fee in clinical medicine	5.00	
Hospital fee	2.25	
Deposit for library, laboratories, etc. (returnable as explained above)	5.00	
Total payment upon matriculation		$17.25

Graduate physicians are permitted to join the class without payment of any fees unless they become candidates for the degree, except where laboratory courses are undertaken, when the usual fee named above is required for each course as elected.

Board

The cost of living will vary with the views of students. Good board, including room, light, and fuel, can be had at prices ranging from $18.00 to $20.00 a month.

Women students of medicine and pharmacy are furnished rooms in University Hall at a cost of $5.00 a month. Students can get good table board in University Hall at a cost of $15.00 a month. The Students' Dining Club is an organization of from 170 to 180 members, the object of which is to furnish good meals on the co-operative plan at a minimum cost.

Students are advised to go directly to the College Building, Strand, between Ninth and Tenth Streets, on their arrival in the city. The provost will be on hand, and will take pleasure in furnishing all necessary information and aid to students desiring to obtain board.

Letters requesting information as to the curriculum, or requests for catalogues, should be addressed to Dr. W. S. Carter, Dean, Medical Department of the University of Texas, Galveston, Texas. Business communications should be addressed to Thomas H. Nolan, Provost, Medical Department of the University of Texas, Galveston, Texas.

SCHOOL OF PHARMACY

ANNOUNCEMENT FOR THE TWENTY-FIFTH ANNUAL SESSION: 1917-1918

The School of Pharmacy was inaugurated with the opening of the session of 1893-1894, in connection with the School of Medicine, in the College Building of the Medical Department. The present session began on October 2, 1916, and will close on May 31, 1917. The twenty-fifth annual session will begin October 1, 1917, and will continue for eight months.

The instruction is conducted by the teaching staff of the chairs of materia medica and therapeutics, physiology, bacteriology, chemistry, and biological chemistry, in connection with that given the classes in medicine, and by the professor of pharmacy and the lecturer on botany and pharmacy. In addition, instruction is given in organic and pharmaceutical chemistry by the Department of Chemistry.

The accommodations of the school are the same as those of the School of Medicine. (See pages 8-10.) The laboratory of pharmacy occupies the east end of the basement of the College Building, which is well adapted to the purpose, being well lighted and supplied with all the forms of apparatus required for the teaching of this important branch. The chemical laboratory occupies the west end of the basement of the building. It accommodates about two hundred and seventy-five working desks or tables, and is supplied with a full stock of chemicals and apparatus for practical work by individual members of the class. The laboratory course in vegetable histology and microscopic pharmacognosy is given in the laboratory of botany, which is equipped with microscopes for teaching this subject by practical exercises to small sections of the class.

REQUIREMENTS FOR ADMISSION

Men and women are admitted to the School of Pharmacy under equal conditions. The requirements for admission are as follows:

1. Age.

Candidates are required to be at least 17 years old, and if under 21 years of age, to present written evidence of permission to matriculate from parent or guardian.

2. Character.

Candidates are required to present testimonials of good character from two reputable and responsible persons, preferably physicians or pharmacists.

3. Vaccination

Each candidate must present evidence of having been vaccinated at a date sufficiently recent to insure immunity against smallpox, or be vaccinated at the time of matriculation.

4. Scholarship

The standard of preliminary education for admission to the School of Pharmacy is eight high-school units, which represent the work usually done in two years in a high-school of the first class. A unit of high-school credit implies a full session of high-school study of five class periods a week at least forty minutes long.

Among the units presented must be the following: Three units in English; two units in history; two units in algebra; one unit in geometry, physics, or a foreign language.

Admission by Diploma or Certificate

The following persons are admitted to the School of Pharmacy without examination: (1) Graduates and students from other approved colleges and universities; (2) students from other departments of this University; (3) students and graduates of the Texas Agricultural and Mechanical College; (4) graduates of the Texas state normal schools; (5) persons holding first-grade state teachers' certificates; (6) graduates of affiliated schools.

Admission by Individual Approval

Candidates over 21 years of age may be admitted upon personal approval by the dean and the examining committee, provided they furnish satisfactory evidence of having had a preliminary education equivalent to that required for admission by examination, so that that they are able to profit by the work undertaken.

Admission by Examination

Candidates who do not meet the conditions named above will be required to pass an examination in the following subjects:

1. *English.* Proficiency in orthography, grammar, rhetoric and composition will be determined by requiring the candidate to write a short essay upon some assigned subject.
2. *History.* The questions cover general history, the history of the United States, and the history of Texas.
3. *Mathematics.* The questions are given on (a) arithmetic, (b) algebra (through quadratic equations), and (c) plane geometry.

Instead of geometry, one year's work in physics, Latin, German, or French may be offered as an equivalent.

Admission to Advanced Standing

Students who have attended one full course of instruction in a recognized school of pharmacy may be admitted to the second year of the course upon passing satisfactory examinations upon the physics of pharmacy, processes of manufacture and the chemical constituents of the official inorganic compounds, pharmaceutical preparations of crude drugs, general inorganic chemistry, physics, chemical physiology, bacteriology, materia medica, and botany, including vegetable histology.

GENERAL INFORMATION

Registration, Examination, etc.

The rules governing examinations, class standing, exemptions, conditions, and promotion are the same as in the School of Medicine (see pages 21-22).

Entrance examinations will be held September 27, 28, and 29, 1917.

Students who matriculate after the registration days (September 28 to October 1, 1917) will be required to pay a delayed registration fee of $3.00. Matriculation after October 15 will not be allowed except by unanimous consent of the Faculty.

Examinations for the removal of conditions and for advanced standing will be held September 27, 28, and 29. No examination for the removal of conditions will be held after October 1 of any year. Students will not be allowed to attend class work until they have matriculated.

PLAN OF INSTRUCTION AND CURRICULUM

The teaching consists of systematic lectures upon pharmacy, bacteriology, botany, and prescription reading, writing, and compounding, together with a large amount of laboratory work upon these subjects. The course of study is a graded one, the students being required to pass an examination upon the matter taught in the junior year before they are permitted to enter the senior class. The following curriculum exhibits the arrangement of the work:

Junior Year

Major subjects: (1) Pharmacy, including prescription compounding and dispensing; (2) general chemistry; (3) materia medica.

Minor subjects: (1) Botany; (2) vegetable histology; (3) pharmacognosy; (4) physiology; (5) physics.

Laboratory work in (1) pharmacy; (2) prescription compounding and dispensing; (3) general chemistry; (4) vegetable histology and plant analysis; (5) pharmacognosy.

Senior Year

Major subjects: (1) Pharmacy, including pharmaceutical manufacturing, the purification of drugs, prescription compounding and dispensing; (2) medical and biological chemistry; (3) organic chemistry; (4) the physiological action and uses of drugs; (5) bacteriology.

Laboratory work in (1) pharmacy, including analytical and

manufacturing pharmacy; (2) medical and biological chemistry, including the analysis of foods and pharmaceuticals; (3) pharmacognosy.

DEPARTMENTS OF INSTRUCTION

PHARMACY

RAOUL RENE DANIEL CLINE, M. A., PH. G., M. D., *Professor of Pharmacy.*

JOHN C. BUCKNER, PH. G., *Lecturer on Pharmacy.*

JUNIOR CLASS

1. Pharmacy.

Two lectures and seven laboratory hours each week during the first term of fifteen weeks; two lectures and ten laboratory hours during the second term (fifteen weeks).

The lectures deal with the theory and practice of pharmacy, special emphasis being laid upon the purification and preservation of pharmaceuticals and chemicals and the methods of combining medicines.

The practical work in the laboratory is devoted to the manufacture and purification of medicated waters, medicated solutions, extracts, fluid extracts, tinctures, wines, syrups, infusions, misturas, elixirs, emulsions, glycerites, vinegars, collodions, eye waters, douches, sprays, gargles, pills, suppositories, ointments, plasters, liniments, etc.

During the latter part of the year special instruction is given in the manufacture of toilet preparations and perfumery.

The first three months of this laboratory course are spent in the study of the physics of pharmacy, *i. e.*, the determination of coefficients of solubilities, points of fusion, points of ebullition, points of congelation, the examination and correction of apparatus, such as balances, graduated vessels, thermometers, pipettes, and burettes. Crystallization, fractional distillation, percolation, infusion, and sublimation are studied from a practical standpoint.

2. Prescription Laboratory.

Twelve hours a week during the first term; nine hours a week during the second term of fifteen weeks.

This course is devoted to the reading, writing, compounding, and dispensing of physicians' prescriptions. Special attention is paid to modes of making medicines sightly, palatable, and permanent.

SENIOR CLASS

3. Pharmacy.

Two lectures and eight laboratory hours a week throughout the session.

These lectures deal with the manufacture, purification, and preservation of chemical salts, acids, alkaloids, alkaloidal salts, resins, resinoids, glucosides, ethers, fruit essences, and syntheticals, such as urotropin, sulphonal, piperazine, acetanilid, phenacetin, aspirin, tanalbin, aristol, tannigen, guncotton, terebene, terpin hydrate, terpinol, thyocol, creosote, menthol, iodoform, iodol, chloroform, chloral, monobromated camphor, camphoric acid, ether, acetic ether, nitrous ether, amyl nitrite, salol, salicin, benzol, nitro-benzol, oil of wintergreen, acetone, gallic acid, pyrogalol, resorcin, beta-nephthol, protargol, sulpho-carbolic acid, sulphocarbolates, etc.

The laboratory course is devoted to the manufacture and purification of the above mentioned substances. Special instruction is given in testing chemicals and pharmaceuticals, and in alkaloidal and glucosidal determinations.

4. Prescription Laboratory.

Eight laboratory hours a week throughout the session.

This course is devoted to the reading, writing, compounding, and dispensing of physicians' prescriptions. Special attention is paid to easy and rapid modes of making prescriptions sightly and palatable, and to methods of increasing their potency and absorbability.

BOTANY

JOHN C. BUCKNER, PH. G., *Lecturer on Botany.*

JUNIOR CLASS

1. Botany.

Two lectures a week throughout the session.

These lectures bear upon structural, physiological, histological, and taxonomic botany, with special reference to pharmacy.

2. Vegetable Histology.

Two laboratory hours a week throughout the session.

In this course special stress is laid upon the microscopic structure of plants used in medicine. This subject is necessary for an intelligent understanding of the course given to the senior class in powdered drugs.

3. Pharmacognosy.

Three laboratory hours weekly during the first term (fifteen weeks); six hours a week during the second term of fifteen weeks.

The course includes the recognition of plants and plant parts, the identification of adulterants, a knowledge of the active constituents, their uses, and a classification of all such plants, together with methods best adapted to their preservation; also the identification of volatile and fixed oils and of various pharmaceutical preparations.

SENIOR CLASS

4. Pharmacognosy.

Four hours a week throughout the session.

This course is devoted to a study of the crystallography of alkaloids and chemicals under the microscope. The microscopical appearance of powdered drugs is dealt with, looking mainly to the detection of adulterants and to the identification of substances examined. The second half of

the session is devoted to testing for all the different active ingredients found in the tissues of medicinal plants. The course is given in the laboratory of vegetable histology.

CHEMISTRY

WILLIAM CUMMING ROSE, B. S., PH. D., *Professor of Biological Chemistry.*
WALTER T. GARBADE, B. S., PH. G., *Adjunct Professor of Chemistry.*
HENRY LEIGH BARTLETT, PH. G., *Assistant in Chemistry.*

1. *General Inorganic Chemistry.*

Junior year. Two lectures and six laboratory hours a week throughout the session.

This is a course in theoretical and descriptive chemistry. The character of the elements, the laws governing their union, their sources, and the methods of isolation and preparation are considered. Special attention is given to compounds found in the body, substances of importance in materia medica, toxicology, and to substances which serve as reagents in the detection and isolation of biochemical products.

In the laboratory each student applies in a practical way the principles of chemistry in isolating chemical elements, making compounds and qualitative analysis.

2. *Physics.*

Junior year. Two lectures a week during the first half of the session.

This course is designed to acquaint the student with the underlying principles of elementary physics, particularly the phenomena of heat, light, and electricity. Those subjects having special bearing upon the work in pharmacy are thoroughly gone into and all lectures are fully illustrated with experiments.

3. *Organic Chemistry.*

Senior year. Four lectures a week during the first term of fifteen weeks.

These lectures treat of the fundamental principles and theories of organic chemistry, the general methods of preparation and synthesis of organic compounds, with a study of their properties, special attention being given to those compounds which are of importance in medicine.

4. Medical and Biological Chemistry.

Senior year. Four lectures and eight laboratory hours each week during the second term of fifteen weeks.

This course comprises a thoroughly practical drill in the qualitative analysis of mixtures of unknowns; in the analysis of potable and mineral waters; analysis of milk; analysis of urine; the principles of gravimetric and volumetric analysis; and the processes of detecting mineral and vegetable poisons in complex organic mixtures.

5. Analytical Chemistry.

Six laboratory hours a week throughout the session.

This course includes the gravimetric and volumetric analysis of chemicals and pharmaceuticals; the estimation of alcohol in beverages and pharmaceutical preparations; and the analysis of foods, fixed and volatile oils, giving special attention to the detection of preservatives and adulterants.

The chemical laboratory occupies the greater portion of the lower floor of the College Building, and contains 275 working tables, each table being supplied with a complete equipment of apparatus and reagents for individual work by each student. The laboratory is well equipped for the purpose of teaching the subject, and the practical work is done by each student.

MATERIA MEDICA AND THERAPEUTICS

EDWARD RANDALL, M. D., *Professor of Materia Medica and Therapeutics.*

1. Materia Medica.

Junior year. Three lectures or recitations a week for fifteen weeks.

These lectures include a general description and classification of crude drugs, their physical, chemical, and medicinal properties, their preparation, doses, tests, antidotes, toxicology, etc.

The laboratory of pharmacy contains a complete cabinet of drugs, active principles, etc., for use by each student in the practical study of materia medica as the different subjects are discussed during the term.

2. *Therapeutics.*

Senior year. Two lectures weekly throughout the session.

In this course the therapeutic classification of remedies and their therapeutic and chemical compatibilities are considered. Prescription writing, with the dosage, in both the metric and the apothecary systems, is duly dwelt upon. It is the aim of the course to qualify the student for the work of the pharmacist, without making a prescribing doctor of him.

BACTERIOLOGY

P. W. COVINGTON, M. D., *Professor of Preventive Medicine.*

CHARLES BELL MCGLUMPHY, PH. C., M. D., *Adjunct Professor of Bacteriology.*

SCOTT STUART FAY, M. A., M. D., *Instructor in Bacteriology.*

Senior year. One lecture or recitation and five laboratory hours a week for fifteen weeks.

This course includes the preparation of the ordinary forms of culture media; the study of the various methods of sterilization and disinfection; staining and mounting bacteria; isolation in pure culture; the cultural characteristics and methods of identification of the more common forms of bacteria; and the practical bacteriological examinations of air, water, milk, etc.

Prior to the session of 1917-18 the course in Bacteriology has been given in the junior year, but beginning in 1918-19 it will be given during the senior year. This subject does not appear on the roster of 1917-18 because it was given to the junior class during the session of 1916-17.

PHYSIOLOGY

WILLIAM SPENCER CARTER, M. D., *Professor of Physiology.*
LAWRENCE EVANS CHAPMAN, B. A., M. D., *Instructor in Physiology.*

Junior year. Four recitations weekly during the second term of fifteen weeks.

This course covers the physiology of digestion, absorption, the blood, respiration, etc. Careful consideration is given to the composition of foods and the changes which they undergo during digestion; the part which each secretion of the alimentary canal plays in the progress of digestion, the circulation of the blood, metabolism, secretions, and excretions. Some knowledge of these physiological processes is necessary for an understanding of the action and therapeutic uses of drugs.

LIBRARY AND READING-ROOM

The library and reading-room of the institution are open to the classes in pharmacy on the same conditions as to students in medicine. The most important works bearing upon the subjects taught in the course are upon the shelves, and the current and back numbers of the best known pharmaceutical journals are available in the reading-room for consultation.

SCHOLARSHIP

In 1889 the Texas State Pharmaceutical Association established a scholarship in the School of Pharmacy of the University of Texas. When first established, the sum of $150 was given, and the selection of the beneficiary was made by a committee approved by the president of the association. In 1900 the sum was increased to $200, and has since remained the same. In 1901, the selection of the holder of the scholarship was left to the professor of pharmacy, his action in the matter being ratified by the executive committee of the association. The scholarship is held at present by Chris A. Olsen of the senior class.

ROSTER OF THE SCHOOL OF PHARMACY, 1917-1918

JUNIOR CLASS: FIRST TERM

Hour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8 a. m.		Physics		Physics		
9 a. m.	Pharmacy	Botany	Pharmaceutical Laboratory	Botany	Pharmacy	Prescription Laboratory
10 a. m.	Prescription Laboratory	Pharmacy Laboratory		Pharmacognosy Laboratory	Prescription Laboratory	Vegetable Histology B
11 a. m.						
12 m.						
2 p. m.	Chemistry Laboratory	Chemistry Laboratory	Prescription Laboratory	Prescription Laboratory	Vegetable Histology A	
3 p. m.						
4 p. m.			Materia Medica	Materia Medica	Materia Medica	
5 p. m.			Chemistry	Chemistry		

ROSTER OF THE SCHOOL OF PHARMACY, 1917-1918

JUNIOR CLASS: SECOND TERM

Hour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9 a. m.	Pharmacy	Botany	Chemistry	Chemistry	Pharmacy	Vegetable Histology Laboratory A
10 a. m.	Prescription Laboratory	Pharmacy Laboratory	Chemical Laboratory	Chemical Laboratory	Prescription Laboratory	
11 a. m.						Vegetable Histology Laboratory B
12 m.						
2 p. m.	Pharmacy Laboratory	Pharmacognosy Laboratory	Pharmacy Laboratory	Pharmacognosy Laboratory	Prescription Laboratory	
3 p. m.						
4 p. m.						
5 p. m.	Physiology	Physiology	Physiology	Botany	Physiology	

ROSTER OF THE SCHOOL OF PHARMACY, 1917-1918

SENIOR CLASS: FIRST TERM

Hour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9 a. m.	Microscopy of Powdered Drugs and Chemicals	Pharmacy Laboratory	Prescription Laboratory	Pharmacy Laboratory	Prescription Laboratory	Analytical Chemistry Laboratory
10 a. m.						
11 a. m.						
12 m.						
2 p. m.		Pharmacy			Analytical Chemistry Laboratory	
3 p. m.	Organic Chemistry	Organic Chemistry	Organic Chemistry	Organic Chemistry		
4 p. m.	Therapeutics					
		Therapeutics				
5 p. m.					Pharmacy	

ROSTER OF THE SCHOOL OF PHARMACY, 1917-1918.

SENIOR CLASS: SECOND TERM

Hour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9 a. m.	Microscopy of Powdered Drugs and Chemicals	Pharmacy Laboratory	Prescription Laboratory	Pharmacy Laboratory	Prescription Laboratory	Biological Chemical Laboratory
10 a. m.						
11 a. m.						Analytical Chemistry Laboratory
12 m.						
2 p. m.	Analytical Chemistry Laboratory	Analytical Chemical Laboratory	Biological Chemical Laboratory	Biological Chemical Laboratory	Biological Chemical Laboratory	
3 p. m.						
4 p. m.	Therapeutics	Therapeutics	Biological Chemistry	Biological Chemistry	Biological Chemistry	
5 p. m.		Biological Chemistry	Pharmacy		Pharmacy	

TEXT-BOOKS

First Year

Pharmacy: Remington's *Pharmacy* ($6.00); *United States Pharmacopeia* ($2.50).

Chemistry: Sadtler and Coblentz's *Pharmaceutical and Medical Chemistry* ($3.50); Garbade's *Manual of Inorganic Chemistry* ($1.50).

Physics: Page's *Elements of Physics* ($1.25); Carhart and Chute's *Physics* ($1.35).

Botany: Kraemer's *Applied and Economic Botany* ($2.50); Gray's *Field Botany* ($1.80).

Materia Medica: Cushny's *Pharmacology and Therapeutics* ($3.75); Bastedo's *Materia Medica, Pharmacology, and Therapeutics* ($3.50); *United States Dispensatory* ($7.00).

Prescription Work: Scoville's *The Art of Compounding* ($2.50).

Pharmacognosy: Kraemer's *Scientific and Applied Pharmacognosy* ($2.50).

Physiology: Pearce and MacLeod ($2.25).

Bacteriology: Hiss and Zinsser's *Bacteriology* ($3.75).

Second Year

Chemistry: Hammersten's *Physiological Chemistry*, translated by Mandel ($4.00); Hawk's *Practical Physiological Chemistry* ($2.50); Leach's *Analysis of Foods* ($7.50); Remsen's *Organic Chemistry* ($1.20); Autenrieth's *Detection of Poisons* ($2.00).

Pharmacognosy: Kraemer ($5.00).

Volumetric Analysis: Coblentz and Vorisek ($1.75).

DEGREES CONFERRED IN 1915

The degree of Graduate in Pharmacy (Ph. G.) was conferred at the commencement held May 31, 1916, on nineteen candidates, as follows:

Eugene Carter Bell
Frank Nicholas Bono
George Washington Clampitt
Walter Vontreese Cobb

William Isaac Davis
Andrew Flint Dickinson
Clyde James Douglas
Francis Marion Harle
Louis Frederick Hodde
Walter Richmond Kleas
William Horatio Lane
Leroy Dudley McCormick
Robert Earl Mann
Robert Murdo Munro
Edgar Elmer Richards
Charles Adlai Stevenson
Alford Williams
Cora Greer Williams
Robert S. Youngblood

ASSOCIATIONS

The graduates of the School of Pharmacy are eligible to membership in the Alumni Association of the Medical Department of the University of Texas. A Pharmaceutical Association, composed of the students of this school alone, has been formed for the study of essentially pharmaceutical problems. The students of pharmacy are eligible to the Students' Association and other student bodies of the Department.

EXPENSES

Fees

Each student on entering the School of Pharmacy is required to pay a University matriculation fee of thirty dollars.

This fee is paid but once. If it has been paid in any other department of the University, it is not again required in the Medical Department. Other fees are in the nature of laboratory fees of five or ten dollars for each laboratory attended to pay for material used by the student in laboratory exercises; and laboratory and library deposits. These deposits are intended to cover the value of apparatus entrusted for use to each student in the laboratories, or of books withdrawn from the library. At the close of the session, on the return of apparatus and books in good condition, these deposits are returned to the student. Articles of apparatus or books not thus returned are charged against these deposits, their cost value deducted therefrom, and the balance returned to the student. When the value of such broken or unreturned property of the school is greater than the deposit, a special charge is made to replace the articles in ques-

tion. The list of expenses given below will indicate the individual items and the total payments required each year, the items of deposit being returnable from the annual total in accordance with the above explanation.

Instead of requiring separate deposits in each of the laboratories, the authorities will require one deposit to be made by each student to cover breakage, loss, or damage to apparatus, books, or other equipment.

A library fee of one dollar is deducted from the library deposit made by each student at the beginning of the session. This will be used to cover the expense of wear and tear of the books, and for binding journals, books, etc.

A hospital fee of $2.25 is required at the time of matriculation for each year. These fees constitute the Students' Hospital Fund which is used to defray the necessary expenses for the care of students in the hospital in case of illness.

Students who matriculate after the registration days (September 27, 28, and 29, and October 1, 1917), will be required to pay a delayed registration fee of $3.00.

JUNIOR YEAR

Matriculation fee		$30.00
Laboratory fee in chemistry	$ 5.00	
Laboratory fee in pharmacy	10.00	
Laboratory fee in bacteriology	5.00	
Hospital fee	2.25	
Total laboratory fees		22.25
Deposit for library, laboratories, etc. (returnable as explained above)		20.00
Total payable upon matriculation		$72.25

SENIOR YEAR

Laboratory fee in chemistry	$ 5.00	
Laboratory fee in pharmacy	10.00	
Hospital fee	2.25	
Total laboratory fees		17.25
Deposit for library, laboratories, etc. (returnable as explained above)		15.00
Total payable upon matriculation		$32.25

Board

Good board, with fuel and lights, can be had at prices ranging from $18.00 to $20.00 a month.

Students are advised to go direct to the College Building, on Strand, between Ninth and Tenth Streets, on their arrival in the city, where the provost of the Medical Department will be found. He will take pleasure in furnishing all necessary information and aid in obtaining board without delay.

Letters requesting information or catalogue should be addressed to Dr. Wm. S. Carter, Dean, Medical Department of the University of Texas, Galveston, Texas. Business communications should be addressed to Thomas H. Nolan, Provost, Medical Department of the University of Texas, Galveston, Texas.

SCHOOL OF NURSING

STAFF OF INSTRUCTORS AND OTHER OFFICERS

ETHEL D'ARCY CLAY, R. N., *Superintendent, Clinical Instructor in Nursing.*
EDNA MONROE, R. N., *Assistant Instructor in Nursing.*
HELEN TOWNSEND LISTER, B. A., *Instructor in Invalid Cooking.*

Lecturers

JAMES EDWIN THOMPSON, F. R. C. S. (ENG.), *Surgical Nursing.*
MARVIN LEE GRAVES, M. D., *Medical Nursing; Nervous and Mental Diseases.*
RAOUL RENE DANIEL CLINE, M. D., *Materia Medica.*
WILLIAM SPENCER CARTER, M. D., *Physiology and Dietetics.*
ALLEN G. HEARD, M. D., *Diseases of Children.*
SETH MABRY MORRIS, M. D., *Diseases of the Eye, Ear, Nose, and Throat.*
ALBERT O. SINGLETON, M. D., *Surgery.*
WILLIAM KEILLER, F. R. C. S. (ED.) *Anatomy.*
GEORGE HENDERSON LEE, M. D., *Obstetrics and Gynecology.*
C. B. MCGLUMPHY, M. D., *Hygiene.*
JESSE A. FLAUTT, M. D., *Obstetrics.*
L. E. CHAPMAN, M. D., *Physiology.*
HARRY O. KNIGHT, M. D., *Anatomy.*
WILLARD R. COOKE, M. D., *Gynecology.*
HERBERT L. MCNEIL, M. D., *Clinical Pathology.*
W. BOYD READING, M. D., *Fever Nursing.*
S. S. FAY, M. D., *Bacteriology.*
LEE RICE, M. D., *Medical Nursing.*

Committee on Instruction

ETHEL D'ARCY CLAY, R. N., *ex-officio.*
From the faculty of the School of Medicine:
JAMES EDWIN THOMPSON, F. R. C. S.
MARVIN LEE GRAVES, M. D.
WILLIAM SPENCER CARTER, M. D., *ex-officio.*

Advisory Board of Lady Managers

Mrs. Edward Randall, President

Mrs. George Sealy
Mrs. George E. Mann
Mrs. L. Fellman
Mrs. J. E. Thompson
Mrs. R. Waverly Smith
Mrs. T. B. Allen
Mrs. H. Kempner
Miss Mary Davis
Mrs. J. Wharton Terry
Mrs. H. L. Ziegler
Mrs. Frederick Schneider
Mrs. R. B. Hawley
Mrs. Waters Davis, Jr.

GENERAL INFORMATION

The School of Nursing was established as a successor to the John Sealy Hospital Training School for Nurses. The latter training school was supported and managed by a board of ladies resident in the city of Galveston, as a public charity, and, while well accomplishing its purpose, it had grown in the course of years to be a tax upon the generosity and attention of those who had become interested in it. In order to save it from going out of existence, therefore, and at the same time to extend the opportunity for medical instruction to the classes of nurses, the regents of the University, in 1897, created the School of Nursing as one of the regular schools of the Medical Department of the University, and the pupil nurses are recognized as students of this branch of the Medical Department. The regents of the University are responsible for the instruction of the student nurses in all branches, and have placed the management of the curriculum in the hands of a committee composed of the Clinical Instructor in Nursing, the Dean, and two members elected annually from the faculty of medicine by the members of the faculty. The committee has arranged a curriculum and appointed, from the members of the teaching staff of the School of Medicine, the special instructors in each branch.

After having completed the course of training satisfactorily, and having complied with all other requirements, the students of the School of Nursing are, upon recommendation of the medical faculty, given diplomas as Graduates in Nursing by the University of Texas and the president of the Board of Managers, on the part of the management of the John Sealy Hospital.

In the establishment of the School of Nursing, the regents of the University have definitely delegated to the Board of Hospital Managers all governmental supervision of the school not directly concerning the instruction of the classes. All questions of admission to classes, rules, regulations governing the duties and privileges of nurses, matters concerning the moral and physical welfare of pupil nurses, support of individual nurses, and matters of penalty or dismissal, are determined by the Board of Hospital Managers.

An Advisory Board of Lady Managers has been created, their duties being to aid the Superintendent of Nurses in questions of government when required, and to advise the Board of Hospital Managers in questions involving the care of the nurses. The members of this board act as visiting committees, and endeavor to keep in touch with the students and to aid them when possible.

For the first four months of the course, candidates who have been approved by the superintendent of nurses will be admitted on probation. At the expiration of this time, if the probationer proves to be capable of continuing the course satisfactorily, she will be admitted to full standing and enrolled as a pupil nurse.

During the period of probation the probationer receives board, lodging, and laundry free. After full admission into the School of Nursing, in return for her services in the wards of the hospital, the student nurse receives board, lodging, laundry, and uniforms free; and, in addition, an allowance of five dollars a month during the remainder of the period of training is made by the Board of Managers to defray the expense for textbooks, etc.

ADMISSION

Those wishing to take the course of instruction must apply to the Superintendent of Nurses, John Sealy Hospital, Galveston, upon whose approval they will be received into the school on probation. The age of candidates must be from twenty to thirty-five years. The candidate should send, with answers to the questions sent to her, two letters testifying to her good moral character, and one from her physician stating that she is in sound health. She should be of at least average height and physique.

Within the first week of probation the applicant will be examined in reading, penmanship, simple arithmetic, and English. Candidates must be able to read aloud well, to write legibly and accurately from dictation, and to understand arithmetic as far as fractions and percentage. While this is the minimum educational requirement, women of superior education are preferred.

The superintendent has full power to decide as to the fitness of a probationist for the work and as to the desirability of her retention to the end of the period of probation. She can suspend any nurse for cause at any time, and, with the formal approval of the Board of Hospital Managers, dismiss a nurse for serious misconduct or inefficiency.

Vacancies in the School of Nursing will be filled on the first of June of each year, or as soon thereafter as possible. It is advisable for students to enter the school before October 1, as the regular courses of instruction are given during the academic year, from October 1 to June 1. Vacancies arising at other times will be filled as they occur.

Candidates who prove satisfactory will be accepted as student nurses after signing an agreement to remain in the service for the length of time required by the rules of the school; to submit to the control of the superintendent; and to obey the rules of the hospital and school. They will reside in the Home for Nurses, adjacent to the hospital, and serve the first year as assistants in any or all of the wards of the hospital.

They will be expected to perform any duty assigned to them by the superintendent, and to act as nurses in any of the wards or in any department of the hospital. They are required during the months of training to wear the dress and shoes prescribed for the institution.

The day nurses are on duty from 7 a. m. to 7 p. m.; the night nurses from 7 p. m. to 7 a. m. Reasonable time is given for meals, exercise, study, and rest. One afternoon each week, and additional time on Sundays, will be allowed to each pupil nurse.

A vacation of two weeks will be allowed each year.

In case of sickness, nurses will be gratuitously cared for in their rooms or in the hospital, but the time lost must be made up.

Blanks containing questions required to be answered by the candidates for the information of the Superintendent of Nurses will be mailed upon application.

COURSE OF TRAINING AND INSTRUCTION

The course of instruction is a graded one, extending over three sessions. The plan of instruction includes systematic lectures, demonstrations, and actual bedside practice of the principles taught, and from time to time, the students are required to present papers upon various themes connected with the work.

The course is arranged as follows:

Junior Year

Systematic lectures upon (1) anatomy; (2) physiology; (3) materia medica, including the dosage and uses of drugs, the antidotes for poisons, etc.; (4) nursing of medical cases (fever nursing); (5) the ethics of nursing, including the duties of nurses in caring for patients, both in hospitals and in private homes.

Practical instruction in ward-work, bed-making, the care of patients, including toilet, feeding, attention to excretions, application of lotions, stupes, poultices, blisters, and the care of the same, prevention and treatment of bed-sores, cupping and leeching, clinical observations, symptoms and the records of temperature, pulse and respiration, baths, enemata, ventilation, disinfection, etc.

Intermediate Year

Systematic lectures upon (1) surgical nursing; (2) medical nursing; (3) obstetrics; (4) gynecology; (5) dietetics.

Practical instruction in surgical nursing, including surgical technique; preparation for operations, both in hospital and in homes; the care of patients after operation; practical experience of three months under a permanent head nurse in the operating room; obstetrical nursing; gynecological nursing; dietetics; the preparation of foods for artificial feeding and for various diseased conditions.

Senior Year

Lectures upon (1) the nursing of infants and children; (2) hygiene; (3) nursing of nervous and mental diseases; (4) eye cases; (5) ear, nose, and throat cases; (6) hospital management

and administration; (7) ethics of nursing, with special reference to the nursing of private patients; (8) massage and Swedish movements; (9) bacteriology.

Practical instruction in infant feeding; the nursing of special cases, including mental and nervous diseases, and diseases of the eye, ear, nose, and throat; urine analysis; massage and Swedish movements; ward management and hospital administration.

The requirements for promotion and graduation are essentially the same as in the School of Medicine. Final examinations are held upon all subjects taught, and the nurse is also graded for the quality of ward work which she has done. Most of the instruction above outlined is given in the hospital and in the Nurses' Home. The practical clinical instruction is given in the wards of the hospital. Some of the lectures and demonstrations are given in the Medical College.

TEXT-BOOKS

Anatomy and Physiology: Kimber.
Primary Nursing: McIsaac.
General Nursing: Sanders.
Dietetics for Nurses: Friedenwald and Rührah.
Massage and Swedish Movements: Ostrum.
Materia Medica: Blumgarten.
Care of the Baby: Griffith.
Surgical Nursing: Stoney's *Surgical Technique.*
Fever Nursing: Wilson.
Nervous Diseases and the Insane: Mills.
Medical Dictionary: Gould.
Obstetrics: DeLee.
Gynecology: DeLee.
Bacteriology: Bolduan and Grund.
Hygiene and Sanitation: Price.

ROSTER OF WARD DUTIES AND INSTRUCTION, 1917-1918

JUNIOR CLASS OF NURSES

Hour	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7 a. m.	Ward	Ward	Ward	Ward	Ward	Ward	Ward
8	Ward	Ward	Ward	Ward	Ward	Ward	Ward
9	Ward	Ward	Ward	Ward	Ward	Ward	Ward
10	Ward	Ward	Ward	Ward	Ward	Ward	Ward
11	Ward	Ward	Ward	Ward	Ward	Ward	Ward
12 m.	Dinner	Dinner	Dinner	Dinner	Dinner	Dinner	Dinner
1 p. m.	Ward	Ward	Ward	Ward	Ward	Ward	Ward
2	Ward	Ward	Ward	Ward	Ward	Ward	Ward
3	Ward	Clinical Instruction	Physiology —H	Clinical Instruction—H	Ward	Ward	Ward
4	Ward	Ward	Materia Medica—H	Ward	Anatomy—C	Medical Nursing—H	Ward
5	Supper	Supper	Supper	Supper	Supper	Supper	Supper
6	Ward	Ward	Ward	Ward	Ward	Ward	Ward

NOTE.—In the above roster, when not noted, it is to be understood that lectures begin with the opening of the fall term of the Medical Department, and continue until the course of instruction is finished, or to the end of the term. H indicates the John Sealy Hospital as the place of the lectures; C, the College Building.

ROSTER OF WARD DUTIES AND INSTRUCTION, 1917-1918

INTERMEDIATE CLASS OF NURSES

Hour	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7 a. m.	Ward	Ward	Ward	Ward	Ward	Ward	Ward
8	Ward	Ward	Ward	Ward	Ward	Ward	Ward
9	Ward	Ward	Ward	Ward	Ward	Ward	Ward
10	Ward	Ward	Ward	Ward	Ward	Ward	Ward
11	Ward	Ward	Ward	Ward	Ward	Ward	Ward
12 m.	Dinner	Dinner	Dinner	Dinner	Dinner	Dinner	Dinner
1 p. m.	Ward	Ward	Ward	Ward	Ward	Ward	Ward
2	Ward	Ward	Ward	Ward	Ward	Ward	Ward
3	Ward	Principles and Practice of Nursing	Obstetrics and Gynecology—H	Medical Nursing	Dietetics—H	Ward	Cooking
4	Ward	Surgical Nursing	Ward	Ward	Clinical Instruction—H	Ward	
5	Supper	Supper	Supper	Supper	Supper	Supper	Supper
6	Ward	Ward	Ward	Ward	Ward	Ward	Ward

ROSTER OF WARD DUTIES AND INSTRUCTION, 1917-1918

SENIOR CLASS OF NURSES

Hour	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7 a. m.	Ward	Ward	Ward	Ward	Ward	Ward	Ward
8	Ward	Ward	Clinical Pathology	Ward	Ward	Ward	Ward
9	Ward	Ward	Ward	Ward	Ward	Ward	Ward
10	Ward	Ward	Ward	Ward	Ward	Ward	Ward
11	Ward	Ward	Ward	Ward	Ward	Ward	Ward
12 m.	Dinner	Dinner	Dinner	Dinner	Dinner	Dinner	Dinner
1 p. m.	Ward	Ward	Ward	Ward	Ward	Ward	Ward
2	Ward	Ward	Ward	Ward	Ward	Ward	Ward
3	Ward	Care of the Eye—H	Principles and Practice of Nursing	Massage—H	Mental and Nervous Diseases	Hygiene—H	Ward
4	Ward	Diseases of Ear, Nose, and Throat			Ethics of Nursing	Pediatrics	Ward
5	Supper	Supper	Supper	Supper	Supper	Supper	Supper
6	Ward	Ward	Ward	Ward	Ward	Ward	Ward

GRADUATES IN NURSING

At the commencement exercises held May 31, 1916, the following graduated from the School of Nursing, receiving the degree of Graduate in Nursing:

Cora Violet Anderson
Edith Catherine Anderson
Carrie Rice Goyen
Annie Lee Konzack
Maude Ethel Mitchel
Anna Coburn Snelling
Virda Steger
Theresa Hermane Wagner
Nellie Emma Watson
Golda Elizabeth Willis

Letters requesting information as to the curriculum of the School of Nursing, or application for admission to the class, should be addressed to the Superintendent of Nurses, John Sealy Hospital, Galveston, Texas.

DEPARTMENT OF MEDICINE

SCHOOL OF MEDICINE

Seniors

Adair, Munsell Lee.....Marshall
Applebe, Edward Whateley.....Galveston
Arnold, Daniel Grady.....Henderson
Bailiff, Henry Carroll.....Garden Valley
Beal, Martha Nelle.....Bertram
Canon, Robert Travis.....Jacksonville
Cheatham, Paul Neyron.....Burnet
Coleman, Stephen Reeves.....Colorado
Compton, Marion Lee.....Fort Worth
Cook, Thomas Eugene.....Belton
DuPuy, Howard Barham.....Tennessee Colony
Giles, Robert Byron.....Alba
Haggard, Charles Houston.....Hillsboro
Harber, Harry Paul.....San Saba
Hendry, Cullen Haygood.....Georgetown
B. A., Southwestern University, 1910
Holderness, John Russell.....Commerce
B. L. and B. A., East Texas Normal College, 1912
Jackson, Isaac Dudley.....Brownwood
D. V. M., Kansas City Veterinary College, 1912
Kirksey, Oscar Thweatt.....San Marcos
Leach, August Felix.....Alvard
Leaverton, Claude Clay.....Grapeland
Lehmberg, Harry Ben.....San Antonio
Lowry, William Price.....Decatur
B. A., Decatur Baptist College, 1912
Luecke, Percy Edgar.....Wichita Falls
McDonald, Joseph Edwin.....San Antonio
McHenry, Rupert Kingsley.....Georgetown
B. A., Southwestern University, 1913
McMeans, Robert Howard.....Galveston
B. A., University of Texas, 1912
McWhirter, William Luther.....Frost
B. A., University of Texas, 1913
Meadows, Feland Lucius.....Douglas, Ariz.
Meredith, William Page.....Texarkana
Michie, Otis Charles.....Terrell
Otken, Luther Boyce.....El Paso
Parks, Charles Campbell.....Lancaster
B. A., Austin College, 1912
Pope, Irvin, Jr.....Tyler
B. S., Marion Institute, 1913

Prichard, Horace DeWitt.....Lancaster
Pritchett, Asa Belvin.....San Marcos
Raney, Daniel Hall.....Meridian, Miss.
B. S., Agricultural and Mechanical College of Mississippi, 1909
Rea, Melvin Oscar.....Pottsville
B. L., Daniel Baker College, 1913
Robinson, H. Reid.....Galveston
Ph. G., University of Texas, 1907
Roe, Mary Elizabeth.....Colorado
Rogers, Hugh Earl.....Milford
B. A., Texas Christian University, 1913
Schoolfield, Emmett Charles.....Stony
Standefer, Fred Wilson.....Meridian
Tharp, Roger Allen.....Huntsville
Underwood, George Milton.....Pinkston
Wedemeyer, William.....Burton
Yeager, Edward Frank.....Mineral Wells
Young, John Dalton.....Covington, La.
B. A. Jefferson College, La., 1907

Juniors

Adams, Rufe Edwin.....Galveston
B. S., Agricultural and Mechanical College, 1910
Alexander, Jewell Clyde.....Marshall
Anders, Walter Lesesne.....Palestine
B. A., George Washington University, 1915
Anderson, Johnson Rose.....Killeen
B. A., University of Texas, 1913
Anderson, Reuben Bennett, Jr.....Seguin
B. A., Austin College, 1914
Andronis, Nicholas.....Lewiston, Me.
B. A., Bates College, 1914
Ball, D.....Lillian
Barcus, William Sheldon.....Waxahachie
Bidelspach, William Carlton.....Crystal City
Boyle, James William.....Shamrock
B. A., Austin College, 1911
Brown, Brian Tuck.....Sherman
B. S., Austin College, 1914
Crutchfield, Earl Dean.....Galveston
B. A., Southwestern University, 1911
Ford, John Faulkner.....Mount Vernon
Harp, Robert Franklin.....Abernathy
B. S., Valparaiso University, 1909
Harrington, Silas Frederick.....Plano
Hastings, Miles Edgar.....Nixon
Hayes, Herbert Thomas.....Midway

Henry, Hiram Bascom.....Jacksonville
B. A., Southwestern University, 1908
Hill, John Ewart.....Jefferson
B. A., Methodist University of Oklahoma, 1914
Horton, Joseph Julian.....Grand Prairie
Kemp, Robert Stanley.....Kentland, Ind.
Kennedy, Edwin Jay.....Houston
B. S., Agricultural and Mechanical College of Texas, 1912; B. A., University of Texas, 1914
Krueger, Julius Thomas.....Austin
Lasater, Oran Robert.....Santo
B. A., University of Texas, 1916
Lehman, Cornelius Ferd.....San Antonio
McKinney, Walter Byron.....McKinney
Mitchner, James McCalla.....Houston
Moore, Prentice Laurie.....San Antonio
Parker, William Luther.....Corpus Christi
B. A., Texas Christian University, 1914
Pope, John Hunter.....Tyler
B. S., Marion Institute, 1913
Robinson, Joseph Anderson.....Midway, N. M.
Rogers, William Haley.....Clarkesville, Ark.
Rudnick, Sarah.....Houston
Schlick, Walter August.....Gonzales
Schoenvogel, Otto Fred.....Moulton
Serofino, Louis Charles.....Beaumont
Shuddemagen, Walter John.....Sabinal
Spradley, Jeems Brutus.....Nacogdoches
Stieler, Albert.....Comfort
Stough, Dowling Bluford.....Vinita, Okla.
Stout, Samuel Donald.....Ennis
Stubblefield, Marmion Lee.....Carbon.
Terry, Jack Stanford.....Ennis
Wagner, Frank Martin.....Shiner
Wills, Thomas Opie.....Corsicana
Womack, Clifford Thomas.....Ed Dorado
Works, Bynum McWhorter.....Waxahachie
B. A., Trinity University, 1913
Young, Roy Carl.....Covington, La.

Sophomores

Alexander, Hugh Elbert.....Blanco
B. A., Baylor University, 1915
Allen, Homer Bryan.....May
Bowen, Porter Guy.....Stephenville
Bowie, Anna Mary.....Nashville, Tenn.
B. S., Vanderbilt University, 1913
Bradley, Raymond Leslie.....Houston

Bybee, Joseph Alexander.....Willis
Cariker, Frederick Hancock.....Cushing
Carroll, Grayson Lewis.....Texarkana
Carter, Christopher Bennett.....Dallas
Cartwright, Hubert Henderson.....Amarillo
Caskey, Charles Rice.....Killeen
Cone, Robert Earl.....Galveston
Deatherage, William Robert.....Dallas
B. A., University of Texas, 1915
Dodson, Alfred Ewing.....Petersburg
B. S., Agricultural and Mechanical College, 1915
Dreiss, Adolph Martin.....San Antonio
Gardner, John Nooe.....Boerne
Geiss, Mollie Amelia.....Dawson, Ga.
B. S., Teachers College, Columbia, 1913
Gibbons, Olin Welborn.....Waxahachie
B. A., Trinity University, 1911
Gilbert, Allan Clay.....Irving
Gilbert, Franklin Monroe.....Irving
Gilliland, Leonard Francis.....Ranger
B. A., University of Texas, 1915
Goldberg, Sylvan Segal.....Palestine
Harris, Titus Holiday.....Georgetown
B. A., Southwestern University, 1915
Hawkins, Charles Pearre.....Fort Worth
B. S., Vanderbilt University, 1914
Hayes, Basil Alexander.....Lott
B. A., Texas Christian University, 1916
Huddleston, William Elton.....Rockdale
Jenkins, Oscar Leonard.....Clarendon
Jones, Isaac Grady.....Manor
Kelley, Cole Chapman.....San Antonio
Kimbrough, Orman Trimble.....Point
Lasater, Waldo Burton.....Austin
B. A., University of Texas, 1915
Maresh, Henry Rudolph.....Weatherford
Maresh, Rudolph Edward.....Weatherford
Margo, Elias Circunsincion.....Rio Grande City
Martin, John Richard.....Georgetown
Miller, Arthur Charles.....New Ulm
B. S., Agricultural and Mechanical College of Texas, 1914
Molloy, Maxwell Suttle.....Corsicana
Moore, Ramsey Hudson.....Clarksville
Nail, James Brown.....Crawford
Nichols, Clarence Virgil.....Lampasas
Orman, McDonald.....Russellville, Ala.
Parrott, James Clifford.....Twin Falls, Idaho
Pierce, Ethel Margaret.....Waco
B. A., Baylor University, 1915

Powell, Leslie Charles.....Deweyville
Pryor, Jessie Walker.....San Antonio
Robison, J. T.....Naples
Roensch, Herbert Edward.....Bellville
Sammons, Howard Payne.....Albany
Schwenkenberg, Arthur John.....Thorndale
Steinwinder, Charles David.....San Antonio
Turner, John Harolde.....Bonney
Tusa, Theo Samuel.....Beaumont
Urban, Kay Bonner.....Bullard
Wattam, James Monroe.....Denton
Wells, Cora Viola.....Rogers

Freshmen

Alexander, Boyd Darwin.....Waco
B. A., Baylor University, 1914
Ayers, Eleanor Hall.....Galveston
B. A., Smith College, 1916
Bagby, Oliver Halbert.....Temple
B. A., Richmond College, 1915
Barnett, John Bryan.....Oletha
Barr, Richard Everett.....Sprinkle
Bartlett, Henry Leigh.....South Houston
Ph. G., University of Texas, 1916.
Barton, Robert Mitchell.....Malakoff
B. A., Southwestern University, 1914
Beaver, Norman Blaine.....Galveston
Beck, Emma.....Killeen
Bennett, Marion Horton.....Galveston
Boswell, Louis Keith.....Fort Worth
B. A., University of Texas, 1916
Brown, Charles Frank.....Dallas
Burg, Edward Moses.....San Antonio
Byram, Mrs. Bertha Elvira.....Galveston
B. S., Occidental College, 1912
Byram, Roy Mack.....Galveston
Campbell, Harris Williams.....Galveston
Campbell, Walter Douglas.....Hillsboro
Chesley, Hervey Edgar, Jr.....Hamilton
B. A., Austin College, 1916
Cornick, George Becker.....San Angelo
Crossley, Samuel Wallace.....San Antonio
David, John Wilson.....Corsicana
B. A., Southwestern University, 1915
Dimmitt, Frank W., Jr.....Galveston
Ph. G., University of Texas, 1914
Duke, Llewellyn Brittain.....Georgetown

Dumas, Walter Alexander.....Fort Worth
B. S. and M. A., Davidson College, 1916
Duncan, Mrs. Clara K.....Houston
Durham, Paul Everett.....Memphis
Estes, Wayne Clifford.....Waxahachie
Faubion, Bynum Burnan.....Marble Falls
Flamson, Richard Joseph, Jr.....Grandview
Foster, Joseph Beverly.....Miles
Freed, Harold.....Galveston
Gambrell, William Mooney.....Lockhart
Gray, Charles Walter.....Del Rio
B. A., Vanderbilt University, 1911
Gregg, Dick Bowling.....Manor
Handley, Bryan.....Barnes
Harrell, Frederick Schiller.....Olney
Heare, Louis Charles.....Miami
Heyman, Julius August.....Junction
Hixson, Louis Dabney.....Galveston
Hodde, Louis Frederick.....Burton
Ph. G., University of Texas, 1916
Hornbeck, Arden Cline.....Tehuacana
Hoshino, Mitsuharu.....Honolulu, Hawaii
Huang, Ho-Sheng.....Chin-Chew, S. China
Iiams, Frank John.....Harrisburg
B. A., Austin College, 1915
Jaeggli, Sam.....Moulton
Jarvis, Marjorie Mason.....San Antonio
B. A., University of Texas, 1913
Jeffreys, Thomas Edison.....Lamkin
Joost, David.....Palestine
Jordan, Dowdell Wylie.....Oglesby
B. A., Baylor University, 1915
Kahn, Samuel Herman.....Dallas
Kendall, Dean Henry.....Houston
B. S., Valparaiso University, 1916
Kennary, Pearley Dresser.....El Paso
King, Sam Richard.....Sherman
Lee, George Townsend.....Galveston
Lenz, Rudolph Pruessner.....Galveston
Lobstein, Henry.....Grosvenor
Maclean, Ewen Kenneth.....Buies, N. C.
McCormac, Edward Phillip.....Marshall
McKenzie, Casimir Perier.....Mexia
B. A., Rice Institute, 1916
McKeon, Hugh Spencer.....Austin
McLeod, James Newton.....Leggett
B. A., Austin College, 1914
McVeigh, Joseph Fielding.....Fort Worth
Magnenat, Louis Earl.....Galveston

Marshall, William Emma.....Bonham
B. A., University of Texas, 1916
Martin, Walter Simeon.....Georgetown
Martin, Zeno Thomas.....Austin
Milliken, Samuel Gibbs.....Dallas
Montague, Laurence Joseph.....Bandera
Moon, Arthur Ernest.....Hillsboro
B. A., University of Texas, 1915
Moore, James Jewell.....Sherman
Morris, Charles Alga.....Bastrop
Naranjo, Jose.....Laredo
Nicholson, John Rector.....Melissa
Nowlin, Ralph Robert.....Avalon
B. A., Trinity University, 1915
Paschal, George Hugh.....San Antonio
Patton, Louis Kellam.....Amarillo
Paul, Harry Walker.....Edna
Pickard, James Marshall.....Pecan Gap
Pickett, Glynn Henry.....Sulphur Springs
Pope, Fielding Meigs.....Sweetwater
Reese, Clarence Hubby.....Waco
Robison, John Matthews.....Austin
Rogers, Annie Laurie.....Virgilina, Va.
Root, James Edwin, Jr.....Killeen
Russell, Daniel Abell.....San Antonio
Sadler, Leslie Raymond.....Gatesville
Spiller, John Browder.....Esperanza
B. A., Rice Institute, 1916
Spivey, James Langdon.....Bellevue
B. A., Southwestern University, 1916
Stafford, Benjamin Alvis, Jr.....Canyon City
Stork, Edwin William.....Round Top
Street, Alvin Murray.....Goldthwaite
B. A., Texas Christian University, 1914
Sublett, Collier Matlock.....Arlington
Tamburo, Gandolfe.....Pittsburg, Pa.
Tanby, Hugh B.....Abilene
Thompson, Leone Sanders.....Stamford
Treadwell, Richard Talmage.....Lufkin
Tull, Raymond Henry.....Carlton
Vance, Lloyd Clifford.....Mineola
Watson, Claude Ernest.....Dallas
Williams, George Raworth.....Childress
Williamson, Cleburne Milton.....Seguin
Winsett, Amos Ewing.....Higgins

SCHOOL OF PHARMACY

Seniors

Barnes, Thomas George.....Lipscomb
Davis, Erroll Bird.....Johnson City
Hudson, Dow.....Goldthwaite
LaBauve, Edmond Clyde.....Edna
Olsen, Chris Antone.....Clifton
Price, Leslie Carroll.....Bastrop
Robinson, Reuben Tarrant.....Missouri City
Rochelle, George Calvin.....Rockwall
Thompson, Clarence.....Nacogdoches
Walther, Gerald John.....Kerrville
Williamson, Payne Lee.....Kerrville
Windle, James Edgar.....Henderson

Juniors

Aiden, M., Sister.....Galveston
Allison, Charles Bryan.....Farmersville
Billings, Franklin Clay.....Harper
Bishop, Virgil Grady.....Roscoe
Burns, John Wesley.....Flint
Clark, Horace James.....Port Arthur
Conwill, Floyd Clifton.....Kerrville
Davis, George Emmitt.....Ballinger
Doss, William Lafayette.....Colorado
Fellbaum, Paul Howard.....San Antonio
Fly, Orceneth Asbury.....Hondo
Gollner, Virgil Emmett.....Carthage
Grothaus, Alfred Warren.....San Antonio
Hallmark, Walter Minet.....Lampasas
Hruzek, Victor.....Nada
Hunter, Ellene Hopkinson.....McKinney
Jenkins, Edwin Gillespie.....Bryan
Karbach, Nelson William.....Beasley
Kennedy, Jefferson Davis.....Bellevue
Lacy, George Claude.....Denton
Latimer, Oscar.....Houston
Levyson, Sidney Maurice.....Boerne
Louise, M., Sister.....Galveston
Mallow, Leslie Eugene.....McKinney
Martin, Everett Earl.....Llano
Martin, Walter Ellis.....Lampasas
Miller, Horton Chapman.....Houston
Milligan, Edward.....Denton
Power, Paul Hershell.....Goldthwaite
Riedel, Wilfred Herman.....Yorktown

Rogers, William Merle.....Munday
Rosenthall, Albert Marion.....Houston
Saunders, Villa Clyde.....Blanco
Simmang, Robert Andrew.....San Antonio
Ward, Maurice T.....Hempstead
Wasinka, Joe Walter.....Taylor
Welch, Luther Wilkins.....Caddo Mills
Williamson, Alfonso Algenon.....Royse City
Wilson, William Walter.....Bowie
Winters, Joe Oppenheimer.....Pearsall

SCHOOL OF NURSING

Seniors

Dearing, Lillian.....Blum
Gold, Virgie.....Wichita Falls
LeNoir, Leatrice L.....Marlin
Moseley, Margaret M.....Port Arthur
Polkinhorn, Winifred.....Laredo
Rock, Julia.....San Antonio
Simmons, Blanch.....Nashville, Ark.
Staton, Willie.....Midland
Wilkins, Cora.....Groveton
Willard, Dora Lee.....Bryan
White, Mattie.....Obar, N. M.

Intermediates

Able, Pamela.....Corpus Christi
Baker, Ruth.....Dallas
Bowles, Beulah.....Throckmorton
Cawthon, Ruby.....Denison
Curry, Myrtle.....Port Arthur
Dennis, Frances.....Victoria
Habig, Doris.....McComb, Miss.
Hanna, Virginia.....Port Arthur
Kennedy, Lillian.....Midland
Maltsberger, Ida.....San Antonio
Manger, Dollie.....Teague
Maxwell, Hattie.....Austin
Middlebrook, Lillian.....Bay City
Peterson, Paula.....Kingsville
Richie, Euphemia.....Powell
Roberts, Eva.....Haskell
Rothig, Hedwig.....Galveston
Samuels, Louise.....Algoa
Tompkins, Eva.....McKinney
Valiquette, Florence.....Alvin
Whiting, Elizabeth.....Okmulgee, Okla.

Juniors

Arnold, Mrs. Ellen	San Antonio
Barnes, Mary	San Antonio
Baty, Ethel	Graham
Brient, Mildred	San Antonio
Carroone, Mary	Algoa
Cone, Vera	Sabinal
Couch, Mary	Ada, Okla.
Dixson, Irma	Kirbyville
Fox, Lonnie	Denton
Gossett, Lillian	Taylor
Haskell, Joyce	Houston
Heiner, Millie	Seabreeze
Hinson, Elizabeth	Amarillo
Huntington, Katherine	Brazoria
Inglet, Martha	Austin
Jackson, Mrs. Sarah	Florence
Kaiser, Katie	Flatonia
Lambertson, Ruth	Fordtran
Lee, Pearl	Waco
McArthur, Carrie	Russellville, Ark.
McGehee, Sarah	Bay City
McLaran, Frances	Waco
Merrell, Esther	Galveston
Moon, Hazel	Danville
Muman, Alice	Beasley
Parker, Vyrtle	Wichita Falls
Powers, Norma	Abilene
Rudnick, Sophie	Houston
Rye, Pearl B	Ratcliff
Spiller, Carrie	Austin
Teich, Mary	Austin
Wheat, Mary	Jamesboro, La.

SUMMARY OF STUDENTS

DEPARTMENT OF MEDICINE

School of Medicine:		
Seniors	47	
Juniors	48	
Sophomores	55	
Freshmen	102—	252
School of Pharmacy:		
Seniors	12	
Juniors	40—	52
School of Nursing:		
Seniors	11	
Intermediates	22	
Juniors	32—	65
Individual students in the Department of Medicine		369

ATTENDANCE BY YEARS

(All departments of the University)

1883-84	221	1900-01	1,121
1884-85	209	1901-02	1,291
1885-86	199	1902-03	1,348
1886-87	245	1903-04	1,353
1887-88	250	1904-05	1,486
1888-89	278	1905-06	1,991
1889-90	309	1906-07	2,273
1890-91	283	1907-08	2,462
1891-92	388	1908-09	2,573
1892-93	353	1909-10	2,701
1893-94	482	1910-11	2,758
1894-95	630	1911-12	2,832
1895-96	730	1912-13	3,334
1896-97	751	1913-14	3,501
1897-98	800	1914-15	3,898
1898-99	986	1915-16	4,208
1899-00	1,041	1916-17	4,566

Beginning with 1910-1911, the figures are for individual students.

AFFILIATED SCHOOLS

Regulations Governing Affiliation

The regents and the faculty desire to bring the University into such close relationship with the high schools of the state that students may be able to pass from the latter to the former without perceptible break in the course of study. The privilege of affiliation, by which graduates of the high schools can enter the University without examination, is offered on the following conditions:

1. When the authorities of any school desire affiliation with the University, they shall make formal application to the Department of School Visitation. Memoranda blanks will be furnished to the superintendent or the principal of the school seeking affiliation. Upon these blanks may be indicated the courses of study in the different branches, the number of teachers and their qualifications, and such information in regard to the apparatus, appliances, etc., as may serve to give a fair idea of the general efficiency of the school.

2. If this information be satisfactory, the authorities of the school may be asked to submit specimen examination papers prepared by students pursuing the high-school subjects in which affiliation may be desired.

3. No school will be affiliated before a visitor of schools shall have visited it, and shall have rendered a report concerning its equipment and work.

4. If the council of affiliation shall be satisfied that the school should be affiliated, the authorities will be duly notified, and the name of the school will be entered, in the proper group, on the list of affiliated schools. The list will be published in the catalogue of the University.

5. Beginning with the session of 1917-1918, a school to be affiliated at all, must prepare its graduates for the freshman class: in English, three units; history, or history and civics, two units; and mathematics (algebra and plane geometry), three units; in all, eight units. Affiliation sufficient to enable graduates to enter without conditions implies enough other units to make fourteen and one-half, including two units in a foreign language. Affilia-

tion sufficient to enable graduates to enter the University conditionally includes enough other units to make twelve and one-half.

6. Affiliation may be secured in the subjects and units listed on page 15.

Concerning Admission Requirements

1. For full admission to the College of Arts and the Engineering Department, fourteen and a half units will be required beginning with the session of 1917-1918. Until the high schools of the state are somewhat better developed, and until further notice is given, students may be admitted with a condition of two units; but such condition must be removed within two years after admission.

2. While all students are urged to present at least two units in one foreign language, the foreign language requirement, as contemplated, will not be enforced until further notice is given The postponement of the enforcement of the foreign language requirement is made in deference to requests from affiliated high schools, and in order to give the schools more time for the development of their foreign language courses. Students who do not satisfy the foreign language requirement on admission must, however, do so within two years thereafter.

3. Applicants for admission to the University who are graduates of affiliated schools will be credited with the subjects in which the schools are affiliated and which have been completed, and will be required to pass examination in such additional subjects, if any, as may be required to make at least twelve and a half units.

Division of Affiliated Schools Into Groups

Affiliated schools are divided into three groups:*

1. The first group includes schools affiliated in at least fourteen and a half units.

2. The second group includes schools affiliated in at least twelve and a half units. Graduates from schools of this group must present twelve and a half units or lose the advantage of affiliation.

3. The third group includes schools affiliated in at least

eight units. The affiliation of a school admitted into the third group may continue for a period of three years, and. if at the expiration of that time the school has not secured sufficient additional units to raise it to the second group, it may continue in the third group for three years more by passing through the steps required for original affiliation.

LIST OF AFFILIATED SCHOOLS

Revised to January 25, 1917.†

E.....English, 3 or 4.

AH....Ancient History, 1.
MH....Medieval and Modern History, 1.
EH....English History, 1.
AmH..American History, ½ or 1.
Civ....Civics, ½.

M.....Mathematics (Algebra and Plane Geometry),3
SG....Solid Geometry, ½
T.....Trigonometry, ½.

L.....Latin, 2, 3, or 4.
Gk.....Greek, 2 or 3.
Ger....German, 2 or 3.
F.....French, 2 or 3.
S.....Spanish, 2 or 3.

Bi.....Biology, 1.
B.....Botany, 1.
C.....Chemistry, 1.
IS.....Introduction to Science,1.
P.....Physics, 1.
Ph....Physiography, ½.
P&H..Physiology and Hygiene, ½
Z.....Zoology, 1.

A.....Agriculture, ½ to 2.
Bg....Bookkeeping, 1.
D.....Drawing, ½ to 2.
DA....Domestic Art, ½ or 1.
DS....Domestic Science, ½ or 1.
MT...Manual Training, ½ to 2.
ST....Stenography and Typewriting, 1.

An asterisk indicates that a school is on the Southern List of Accredited Schools.

Abbreviations without numbers stand for subjects and the minimum number of units allowed: abbreviations with numbers stand for subjects and units beyond the minimum.

In the lists below, the school referred to is the high school of the town named, unless otherwise indicated.

†A large percentage of the changes in affiliation are made after the catalogue goes to press. The changes for the year are embodied in a separate bulletin issued in June. The Visitor of Schools will send a copy on request.

GROUP I

(Schools in this group have at least fourteen units of credit.)

*Abilene: E—AH,MH,EH,AmH,Civ—M,SG,—L,Ger—B,C,P,Ph,P&H—DA,DS. *Superintendent*, J.L.Brooks, B.A.; *Principal*, A.H. Roberts, B.S.

Academy of Our Lady of the Lake, San Antonio: E—AH,MH, AmH,Civ—M,SG,T—L,Ger3—C,P,Ph,P&H. *Superintendent*, Fr. H.J. Constantineau, M.A.; *Principal*, Mother M. Philothea.

Allen Academy, Bryan: E—AH,MH,EH,AmH1—M,SG,T—L,Ger. *Principals*, J.H.Allen, R.O.Allen, B.S., B.A.

Alice: E—AH,MH,EH,AmH,Civ—M,SG—L,S3—P,Ph. *Superintendent*, J.G.Toland, B.P.BS.; *Principal*, W.A.Hewatt.

Alvin: E—AH,MH,EH,AmH,Civ—M,SG—L,Ger3—P,P&H. *Superintendent*, D.R.Hibbetts, B.S.

*Amarillo: E—AH,MH,EH,AmH,Civ—M,SG,T—L4,S3—B,C,P,Ph—A,DS1. *Superintendent*, M.H.Duncan, M. A.; *Principal*, J.L. Duflot, B.S.

*Austin: E4—AH,MH,AmH1,Civ—M,SG,T—L4,Ger3,F3,S3—B,C,P, Ph,P&H,Z—Bg1,D1,DA1,DS1,MT1,ST. *Superintendent*, A.N. McCallum, B.A.; *Principal*, J.E.Pearce, M.A.

*Ball, Galveston: E—AH,MH,AmH1—M,T—L,F3,Ger3,S3—C,P, Ph—Bg1. *Superintendent*, John W.Hopkins, M.A.; *Principal*, W.A.James, M.A.

*Ballinger: E—AH,MH,EH,AmH,Civ—M,SG,T—L,Ger3—P,Ph,P&H. *Superintendent*, W.S.Fleming, B.A.; *Principal*, J.M.Skinner, B.S.

Bastrop: E—AH,MH,AmH,Civ—M,T—L,Ger—C,P,Ph,P&H. *Superintendent*, F. R. Shanks; *Principal*, L. A. Koenig, B.A.

Bay City: E—AH,MH,EH,AmH1—M,SG,T—L,Ger—C—MT. *Superintendet*, R.E.Scott; *Principal*, A.A.Aldrich, B.A.

*Beaumont: E4—AH,MH,EH,AmH,Civ—M,SG,T—L4,Ger3,F3,S3—B,C,P,Ph,P&H—Bg1,DA1,DS1,MT1,ST. *Superintendent*, H.F. Triplett, M.S.; *Principal*, J. G. Fuqua, B.S.

Beeville: E—AH,MH,AmH,Civ—M,SG,T—L,S3—C,P—Bg1. *Superintendent*, W.E.Madderra; *Principal*, J.P.Massey, M.A.

*Belton: E4—AH,MH,EH,AmH,Civ—M,SG—L4,S3—B,P,Ph—Bg1,DS. *Superintendent*, L.H.Hubbard, B.S.

---

*On Southern List of Accredited Schools.

Bellville: E—AH,MH,EH,AmH,Civ—M,SG,T—Ger3—P,Ph,P&H, Z. *Superintendent*, C.N.Shaver; *Principal*, J.H.Spivey, B.A.

Big Spring: E—AH,MH,AmH,Civ—M,SG—L—P,Ph,P&H. *Superintendent*, M.H.Brasher, B.A.; *Principal*, W.A.Mancill, B.A.

Blinn Memorial College, Brenham: E—AH,MH,AmH1,Civ—M,T—Ger3—C,P,Ph,P&H—Bg1. *President*, J.L.Neu, B. A.

*Bonham: E4—AH,MH,AmH,Civ—M,SG—L4,Ger3—B,C,P,Ph,P&H,Z—D,DA,DS1,MT1. *Superintendent*, H.D.Fillers, B.A.; *Principal*, L.H.Rather, B.A.

Bowie: E—AH,MH,EH,AmH,Civ—M,SG,T—L,Ger3—P,Ph,P&H. *Superintendent*, T.P.Walker, M. A.; *Principal*, J.R.Roberts, B.A.

*Brady: E—AH,MH,EH,AmH1—M,SG,T—L,S—Bi,C,P,Ph,P&H. *Superintendent*, W.L.Hughes; *Principal*, C.J.Niissle, B.A.

Brenham: E—AH,MH,EH,AmH,Civ—M,SG,T—L,Ger3—P—DA, DS,MT. *Superintendent*, W.D.Notley; *Principal*, Miss Eula P. Carroll.

Britton's Training School, Cisco: E—AH,MH,EH,AmH1—M,SG. T—L—Ph. *President*, O.C.Britton, B.A.

Brownsville: E—AH,MH,EH,AmH,Civ—M,SG—L,S3—P,Ph,P&H—DA,DS. *Superintendent*, Miss Lizzie M. Barbour; *Principal*, P.D.Kennamer, B.E.

Brownwood: E—AH,MH,EH,AmH,Civ—M,SG,T—L4,Ger—Bi,C. P. *Superintendent*, V.L.Griffin, M.Pd.; *Principal*, C.H.Hufford.

Bryan: E—AH,MH,EH,AmH1—M,SG—L—P—D,MT1. *Superintendent*, W.C.Lawson, B.S.,M.A.; *Principal*, George Simpson, B.S.

Caldwell: E—AH,MH,AmH,Civ—M,T—L,Ger3—P,Ph,P&H. *Superintendent*, J.M.Smith; *Principal*, A.R.Stephens.

Calvert: E—AH,MH,EH—M,SG,T—L—C,P. *Superintendent*, I.N. Stephens, LL.B.; *Principal*, Mrs. Glennie Wilson Corby, B.Lit.

*Cameron: E—AH,MH,EH,AmH,Civ—M,SG—L,Ger3—C,P,Ph,P&H. *Superintendent*, J.E.Watts, B.A.; *Principal*, C.D.Eaves, B.A.

Canadian: E—AH,MH,EH,AmH1—M,SG,T—L—C,P,P&H. *Superintendent*, C.A.Gilley; *Principal*, H.A.Glass.

Canyon: E—AH,MH,EH,AmH1—M SG—L,S—P,Ph. *Superintendent*, E.F.King; *Principal*, E.R.Archambeau.

Carthage: E—AH,MH,EH,AmH,Civ—M,SG,T,L—C,P,Ph,P&H. *Superintendent*, J.D.Warren, B.A.; *Principal*, C.M.Holmes, M.A.

*Center: E—AH,MH,EH,AmH—M,SG,T—L—P,Ph,P&H. *Superintendent*, G.E.Adams; *Principal*, J.R.McElRoy, B.A.

*On Southern List of Accredited Schools.

Childress: E—AH,MH,EH,AmH1—M,SG—L—P,Ph—DS1,MT1. *Superintendent*, B.F.Sisk, M.A.; *Principal*, R.E.Glaze, B.A.

Çisco: E—AH,MH,EH,AmH,Civ—M,SG—L,S—C,P,Ph,P&H—DA, DS1. *Superintendent*, R.D.Green; *Principal*, H.B.Lofland, B.A.

Clarendon: E—AH,MH,EH,AmH,Civ—M,SG—L—P. *Superintendent*, W.R.Silvey; *Principal*, E.L.Harwell, B.A.

*Clarksville: E—AH,MH,AmH,Civ—M,SG—L,Ger—C,P,Ph,P&H. *Superintendent*, R.M.White, B.A.; *Principal*, L.D.Williams, B.A.

*Cleburne: E4—AH,MH,EH,AmH1,Civ—M,SG,T—L,Ger3,S—B, C,P,Ph,P&H—A1,DA,DS. *Superintendent*, Emmett Brown, B.A.; *Principal*, J.G.Dunlap, B.A.

Coleman: E—AH,MH,EH,AmH,Civ—M,SG—L—C,P—DA,DS. *Superintendent*, J.E.Hickman, B.S.,B.A.; *Principal*, I.C.Bagwell, B.S.

Comanche: E—AH,MH,AmH,Civ—M,SG—L—C,P,Ph,P&H. *Superintendent*, R.F.Holloway, B.S.; *Principal*, J.B.Layne.

Commerce: E—AH,MH,EH,AmH,Civ—M,SG—L—P. *Superintendent*, A.L.Day; *Principal*, D.B.Powell.

Cooper: E—AH,MH,AmH,Civ—M—L—C,P,P&H—DA,DS. *Superintendent*, J.H.Newton, B.S.; *Principal*, H.G.Sapp.

Coronal Institute, San Marcos: E—AH,MH,EH,AmH,Civ—M,SG, T—L,Ger,S—C,P. *President*, V.A.Godbey; *Principal*, A.N. Averyt, B.A.

Corpus Christi: E—AH,MH,EH,AmH,Civ—M,SG,T—L4,S3—C,P, Ph,P&H—D,DA,DS,MT1. *Superintendent*, J.C.Tucker, B.S.; *Principal*, R.D.Coley, B.A.

*Corsicana: E4—AH,MH,EH,AmH1,Civ—M,SG,T—L4,Ger3—C,P, Ph,P&H—DA,DS1. *Superintendent*, J.E.Blair, B.S.; *Principal*, G.O.Glough, B.A.

Crockett: E—AH,MH,AmH,Civ—M,SG—L,Ger—B,P,Ph,P&H. *Superintendent*, Donald McDonald, M.A.; *Principal*, B.F.Thomas, B.A.

Cuero: E—AH,MH,EH,AmH,Civ—M,SG,T—Ger3—C,P,Ph,P&H— D,DA1,DS1,MT1. *Superintendent*, A.S.Bush, B.S.; *Principal*, L.B.McGriffin.

*Dallas Main: E4—AH,MH,EH,AmH,Civ—M,SG,T—L4,Ger3, F3, S3—B,C,P,Ph,Z—Bg1,D1,DA1,DS1,MT1,ST. *Superintendent*, J. F.Kimball, M.A.; *Principal*, N.R.Crozier, B.A.

*Dallas Oak Cliff: See Oak Cliff.

*On Southern List of Accredited Schools.

Del Rio: E—AH,MH,EH,AmH,Civ—M,SG—L,S3—C,P,Ph. *Superintendent*, W.T.Pollard; *Principal*, H.C.Roberts.

Denison: E—AH,MH,EH,AmH1—M,SG,T—L4,Ger3,F—Bi,C,P,Ph—Bg1,D,DA1,DS1,MT1,ST. *Superintendent*, F.B.Hughes, B.S.: *Principal*, B.McDaniel.

Denton: E4—AH,MH,EH,AmH,Civ—M,SG,T—L4—C,P,Ph,P&H—Bg,DA,DS. *Superintendent*, J.W.Beaty, B.A.; *Principal*, A.Logan, M.A.

Dublin: E—AH,MH,EH,AmH,Civ—M,SG,T—L,Ger—P,Ph. *Superintendent*, S.L.Wolfe; *Principal*, M.G.Abney, B.A.

Eagle Lake: E—AH,MH,AmH—M,SG,T—S—C,P—DA,DS1. *Superintendent*, J.H.Morgan.

Edna: E—AH,MH,EH,AmH1—M,SG—L—P,Ph. *Superintendent*, James F. Johnson.

Elgin: E—AH,MH,AmH,Civ—M,SG—L,Ger. *Superintendent*, J.T.Alexander; *Principal*, S.M.Melton, B.A.

*El Paso: E4—AH,MH,EH,AmH1—M,SG,T—L4,Ger3,F,S3—C,P,Ph, P&H—Bg1,D1,DA,DS,MT1,ST. *Superintendent*, R.J.Tighe; *Principal*, A.H.Hughey, B.A.

*Ennis: E—AH,MH,EH,AmH,Civ—M,SG,T—L,Ger3—B,C,P,Ph. *Superintendent*, J.D.Coghlan; *Principal*, W.P.Fulton, B.S.

*Farmersville: E—AH,MH,EH,AmH,Civ—M,SG—L—P,Ph,P&H. *Superintendent*, W.A.Canon; *Principal*, O.B.Mosley, B.A.

Floresville: E—AH,MH,EH—M—L,Ger—P,Ph. *Superintendent*, W.B.Toone, B.A.; *Principal*, J.A.Poston.

*Forney: E—AH,MH,EH,AmH,Civ—M,SG,—L—P,Ph—Bg. *Superintendent*, H.E.Gable, B.A.; *Principal*, T.N.Kincanon.

*Fort Worth: E4—AH,MH,EH,AmH,Civ—M,SG,T—L4,Ger,F,S—B,C,P—Bg,D1,DA1,DS1,MT1,ST. *Superintendent*, M.H.Moore: *Principal*, R.L.Paschal, B.A.

Fort Worth, North Side: See North Fort Worth.

Fredericksburg: E—AH,MH,EH—M,SG,T—Ger3—P,Ph,P&H. *Superintendent*, W.Z.Bates; *Principal*, Julia Estill, M.A.

*Gainesville: E—AH,MH,EH,AmH,Civ—M,SG—L,Ger,S—C,P,Ph, P&H—DA,DS,MT. *Superintendent*, O.R.Anderson, B.Pe.; *Principal*, E.C.McDonald, B.A.

*Galveston: See Ball.

Garland: E—AH,MH,AmH,Civ—M,SG—L—C,P,Ph. *Superintendent*, C.L.Ward, B.S.; *Principal*, J.L.Dickson, B.A.

*On Southern List of Accredited Schools.

Gatesville: E—AH,MH,EH,AmH,Civ—M,SG—L—P,Ph—A1,Bg, DA. *Superintendent*, George W.Harris, M.A.; *Principal*, O.W. Greene, B.S.

Georgetown: E—AH,MH,EH,AmH,Civ—M,SG—L,S—P,Ph,P&H—A. *Superintendent*, John W.Clark; *Principal*, C.S.Simonds.

Gonzales: E—AH,MH,EH,AmH,Civ—M,SG—L,Ger—C,P,Ph,P&H. *Superintendent*, W.E.Patty, Ph.B.; *Principal*, S.W.Bass.

Graham: E—AH,MH,EH,AmH1—M,SG,T—L—P,Ph. *Superintendent*, E.L.Howell; *Principal*, A.M.Freeman, B.A.

Grandview: E—AH,MH,AmH1—M—L,Ger—P. *Superintendent*, N.O.Robbins, L.I.; *Principal*, C.E.Jackson.

*Greenville: E—AH,MH,EH,AmH,Civ—M,SG,T—L,Ger—B,C,P,Ph, P&H,Z—D,DA,DS1,MT. *Superintendent*, L.C.Gee, M.A.; *Principal*, B.E.Masters, B.A

Hamilton: E—AH,MH,AmH,Civ—M,SG—L—C,P. *Superintendent*, R.D.Foster; *Principal*, C.M.Livsey, B.A.

Hardin School for Boys, Dallas: E—AH,MH,EH,AmH—M,SG, T—L—P. *Principal*, John A.Hardin, B.A.

Harrisburg: E—AH,MH—M,SG—L—C,P—D,MT1. *Superintendent*, W.C.Hanner; *Principal*, J.D.Moncrief.

Haskell: E—AH,MH,EH,AmH1—M,SG—L—P—DA,DS. *Superintendent*, R.J.Turrentine, M. A.

*Henderson: E—AH,MH,EH,AmH,Civ—M,SG,T—L,Ger—C,P,Ph, P&H. *Superintendent*, P.B.Bittle, B.S.; *Principal*, C.A.Lanier, B.A.

Henrietta: E—AH,MH,EH,AmH—M,SG—L,Ger—P. *Superintendent*, C.F.Walker, B.S.; *Principal*, H.M.Muse.

Hereford: E—AH,MH,EH,AmH,Civ—M,SG—L—P,Ph,P&H—D. *Superintendent*, B.M.Harrison, B.A.; *Principal*, L.Fertsch.

Hico: E—AH,MH,AmH,Civ—M,SG—L—C,P. *Superintendent*, C. C.Comer, B.A.; *Principal*, J.C.Wilkerson, B.A.

*Hillsboro E4—AH,MH,EH,AmH,Civ—M,SG,T—L4,Ger3—C,P,Ph, P&H—A,Bg1,DA,DS,MT. *Superintendent*, W.T.Lofland, B.A.; *Principal*, B.W.Wiseman, B.A.

Hockaday School, Dallas: E—AH,AmH1—M—L,F,Ger. *Principal*, Ela Hockaday.

Honey Grove: E—AH,MH,EH,AmH,Civ—M,SG—L,Ger3—C,P—D,DA,DS1,MT. *Superintendent*, W.L.Willis; *Principal*, L.F. Connell.

---

*On Southern List of Accredited Schools.

*Houston: E4—AH,MH,AmH,Civ—M,SG—L4,Ger3,S3—C,P,Ph—D1,DA1,DS1,MT1,ST. *Superintendent*, P.W.Horn, M.A.; *Principal*, W.G.Smiley, B.A.

*Houston Heights: E—AH,MH,EH,AmH,Civ—M,SG—L4,Ger3—P,Ph,P&H—Bg1,DA,DS,MT1,ST. *Superintendent*, S.R.Waltrip; *Principal*, I.V.Brock.

Hubbard: E—AH,MH,EH,AmH,Civ—M,SG—L—P,Ph,P&H. *Superintendent*, S.B.Foster, M.A.; *Principal*, O.L.Wilkins, B.A.

Huntsville: E—AH,MH,EH—M,SG—L,Ger—P,P&H—MT1. *Superintendent*, G.A.Odam, M.A.; *Principal*, E.E.Averitte, M.A.

Itasca: E—AH,MH,EH,AmH,Civ—M,SG,T—L—P,Ph. *Superintendent*, J.J.Godbey, B.A.; *Principal*, R.L.Huff, B.S.

Kaufman: E—AH,MH,EH,AmH,Civ—M,SG—L—C,P,P&H—D,DA1MT1. *Superintendent*, O.P.Norman; *Principal*, W.W.Rogers, B.A.

Kingsville: E—AH,MH,AmH,Civ—M,SG—L—C,P,Ph,P&H—A DA,DS,MT. *Superintendent*, C.A.Peterson, B.S.; *Principal*, G.F.Wilson, B.L.

Kirkley School, Greenville: E—AH,MH,EH,AmH—M,SG—L,Ger—C,P,Ph. *Principal*, J. A. Kirkley.

La Grange: E—AH,MH,AmH,Civ—M—L,Ger3—C,P,Ph,P&H. *Superintendent*, W.J.Kirk; *Principal*, Mrs. J. C. Armstrong.

Lampasas: E—AH,MH,EH,AmH,Civ—M—L—C,P,Ph. *Superintendent*, G.D.Scott; *Principal*, W.W.Battle, B.S.,B.A.

Laredo: E—AH,MH,EH,AmH1—M,SG,T—L,S3—B,P,Ph. *Superintendent*, L.J.Christen; *Principal*, Miss Katherine Tarver.

Llano: E—AH,MH,EH,AmH,Civ—M,SG—L,Ger—P,Ph—Bg. *Superintendent*, D.F.McCollum, M.A.; *Principal*, W.M.Slagle, B.A.

Lockhart: E—AH,MH,AmH—M,SG—L4—C,P,Ph,P&H—Bg1,ST. *Superintendent*, R.T.Pritchett, B.A.

*Longview: E4—AH,MH,EH,AmH,Civ—M,SG,T—L4,Ger—B,C,P,Ph,P&H,Z. *Superintendent*, S.J.Blocker, C.E.,M.A.; *Principal*, L.W.Morton, B.S.

Lubbock: E—AH,MH,EH,AmH1—M,SG,T—L,S3—P. *Superinteendent*, M.MDupre, B.S.; *Principal*, G.N.Atkinson.

*Lufkin: E—AH,MH,EH,AmH—M,SG—L,Ger—C,P,Ph—D,MT1. *Superintendent*, S.W.Dirickson, B.S.; *Principal*, R.C.Morris B.A.

*On Southern List of Accredited Schools.

*McGregor: E—AH,MH,EH,AmH,Civ—M—L,Ger—A,P,Ph,P&H—Bg,DS1. *Superintendent*, H.P.Walker, B.S.; *Principal*, E.C. Burnham, B.A.

McKinney: E4—AH,MH,EH,AmH,Civ—M,SG—L,Ger—C,P.Ph,P&H—D,DS1,MT. *Superintendent*, J.S.Carlisle, B.S.; *Principal*, J.H.Head, B.A.

Mansfield: E—AH,MH,AmH,Civ—M,SG—L—C,P. *Superintendent*, V.A.Byrd; *Principal*, Miss Ora Driskill.

*Marlin: E4—AH,MH,EH,Aml—M,SG,T—L4,Ger3—Bi,C,P,Ph,P&H—A1,D1,DA1,DS1,MT1. *Superintendent*, A.C.Ferguson, M.A.; *Principal*, M.L.Caldwell, B.A.

*Marshall: E—AH,MH,EH,AmH,Civ—M,SG,T—L,Ger—B,C,P,Ph,P&H—A,D1,DA1,DS1,MT. *Superintendent*, J.P.Glasgow, M.A.; *Principal*, A.J.Robinson, B.A.,B.S.

Mart: E—AH,MH,EH,AmH,Civ—M,SG—L—C,P,Ph,P&H—Bg,ST. *Superintendent*, Edgar McLendon, B.A.; *Principal*, I.K.Stephens, B.A.

Memphis: E—AH.MH,AmH,Civ—M,SG—L,Ger—P. *Superintendent*, O.B.Rollins; *Principal*, L.E.Thompson, C.E.

Mexia: E—AH,MH,EH,AmH1 — M,SG,T—L,Ger3—Bi,C,P,P&H. *Superintendent*, W.T.Adams; *Principal*, Miss Mattie Watson.

Midland: E—AH,MH,EH.AmH,Civ—M,SG—L4,S3—C,P,Ph,P&H. *Superintendent*, W.W.Lackey; *Principal*, J.E.Nelson, B.A.

*Mineola: E—AH,MH,EH,AmH,Civ—M,SG,T—L,Ger—C,P,Ph,P&H—DA,DS1. *Superintendent*, P.E.Wallace, B.A.; *Principal*, E. McMullen, B.A.

Mineral Wells: E—AH,MH,EH,AmH1—M,SG,T—L4,Ger—P,Ph,P&H. *Superintendent*, E.O.McNew; *Principal*, B.M.Dinsmore, B.A.

*Nacogdoches: E—AH,MH,EH,AmH,Civ—M—L4,Ger3—C,P,Ph—D,MT. *Superintendent*, J.T.Davis.

Navasota: E—AH.MH,EH,AmH,Civ—M,SG—L,Ger—C,P,Ph,P&H—D1,DA.DS.MT. *Superintendent*, J. Thomas Davis; *Principal*, L.G.Andrews.

New Braunfels: E—AH,MH,AmH,Civ—M—Ger3,S—C,P—DA,DS. *Superintendent*, Bodo Holekamp; *Principal*, N.E.Scudder.

Nocona: E—AH,MH.EH,AmH1—M,SG—L—P,Ph. *Superintendent*, Ross Compton, B.A.,B.S.; *Principal*, J.N.Sisk.

*On Southern List of Accredited Schools.

North Fort Worth: E—AH,MH,EH,AmH,Civ—M,SG,T—L4,Ger3—C,P—D,DA1,DS1,MT1. *Superintendent*, M.H.Moore; *Principal*, A.B.Fincher.

*Oak Cliff, Dallas: E4—AH,MH,EH,AmH,Civ—M,SG,T—L4,Ger3,S—C,P—Bg1,D1,DA1,DS1,MT1,ST. *Superintendent*, J.F.Kimball, M.A.; *Principal*, W.H.Adamson.

Orange: E—AH,MH,EH,AmH,Civ—M,SG,T—L,Ger—C,P—Bg1,ST. *Superintendent*, E.B.Stover, B.A.; *Principal*, Miss Helen Carr.

Ozona: E—AH,MH,EH,AmH,Civ—M,SG—L—P—D,DA,DS,MT. *Superintendent*, J.B.Smith; *Principal*, J.B.Rutland,B.S.

*Palestine: E—AH,MH,AmH1—M,SG,T—L,Ger3—B,P,Ph,P&H. *Superintendent*, L.B.Gill, L.I.; *Principal*, A.H.Fullbright, B.A.

Paris: E4—AH,MH,EH,AmH,Civ—M,SG—L,Ger3,S—B,C,P,Ph,P&H,Z—DA1,DS1,MT. *Superintendent*, J.G.Wooten; *Principal*, E.L.Dohoney,Jr., B. Lit.

Petrolia: E—AH,MH,EH,AmH—M,SG—L—C,P,Ph,P&H. *Superintendent*, W.J.McConnell, B.A.; *Principal*, W.I.Stephenson, B.A.

*Pittsburg: E—AH,MH,AmH1—M,SG—L4—C,P,Ph,P&H—DS1. *Superintendent*, R.C.Campbell, B.S.; *Principal*, T.J.White, B.A.

Plainview: E—AH,MH,EH,AmH,Civ—M,SG—L4,S—P,Ph. *Superintendent*, J.W.Campbell; *Principal*, H.P.Webb, B.A.

Plano: E—AH,MH,EH,AmH,Civ—M,SG—L—B,P,Ph,P&H,Z. *Superintendent*, A. M. Blackman, L. I.; *Principal*, G.C.Good, B.A.

*Port Arthur: E—AH,MH,EH,AmH,Civ—M,SG,T—L,Ger3—B,C,P,Ph,P&H—D,DA,DS1,MT1. *Superintendent*, G.M.Sims, B.A.; *Principal*, E.W.Bartholomae, B.A.

*Quanah: E—AH,MH,EH,AmH,Civ—M,SG—L,S—B,P. *Superintendent*, J.W.O'Banion; *Principal*, I.I.Isbell, B.S.

Richmond: E—AH,MH,EH,AmH,Civ—M,SG—L,Ger—P. *Superintendent*, T.A.Fisher, B.A.; *Principal*, Miss Ella Billingslea.

Rockdale: E—AH,MH,EH,AmH,Civ—M,SG—L—P,Ph,P&H. *Superintendent*, C.G.Green; *Principal*, W.H.McKinney, B.A.

Rosebud: E—AH,MH,AmH1,Civ—M,SG—L—P,P&H—DS. *Superintendent*, W.H.Woodley, B.A.

Saint Mary's Academy, Austin: E—AH,EH,AmH,Civ—M,SG,T—L,Ger.3—C,P. *Superintendent*, Sister M. Cecily.

*San Angelo: E—AH,MH,EH,AmH1—M,SG—L4,S3—C,P,Ph,P&H

*On Southern List of Accredited Schools.

—D1,DA1,DS1,MT1. *Superintendent*, F.E.Smith, M.S.; *Principal*, W.A.Pile, B.A.

San Antonio: E4—AH,MH,AmH,Civ—M,SG,T—L4,Ger3,S3—B,C,P, Ph,P&H—Bg,D1,DA1,DS1,MT1,ST. *Superintendent*, C.S.Meek M.A.; *Principal*, H.H.Ryan, M.A.

*San Antonio Academy: E—AH,MH,AmH,Civ—M,SG,T—L,Ger, S—P. *Principal*, W.W.Bondurant, M.A.

San Augustine: E—AH,MH,EH,AmH,Civ—M,SG—L—P,PhP&H. *Superintendent*, O.J.Holmes; *Principal*, J.J.Younblood, B.A.

*San Benito: E—AH,MH,AmH,Civ—M,SG,T—L,S3—C,P,Ph—A1 DS1. *Superintendent*, A.O.Strother, M.A.; *Principal*, H.D.Phillips, B.A.

San Marcos: E—AH,MH,EH,AmH,Civ—M,SG—L,S—C,P,Ph,P&H —D,DA,DS,MT1. *Superintendent*, E.M.Day; *Principal*, J.W. Scott, M.A.

*San Marcos Baptist Academy: E4—AH,MH,EH,AmH,Civ—M,S G,T—L,Ger,S—B,P. *President*, J.V.Brown, M.A.

San Saba: E—AH,MH,EH,AmH—M,SG—L,Ger—P. *Superintendent*, W.W.Hart; *Principal*, W.L.Ellison, B.A.

*Seguin: E—AH,MH,EH,AmH1—M,SG—L,Ger3—P,Ph. *Superintendent*, R.E.L.Adams, Ph.B.; *Principal*, Max Weinert, B.S.

Seymour: E—AH,MH,AmH,Civ—M—L—C,P,Ph. *Superintendent*, W.E.Edelen, M.A.; *Principal*, W.O.Edwards, B.A.

Sherman: E—AH,MH,AmH,Civ—M,SG,T—L4,Ger—B,C,P,Ph,P&H —D1,DA1,DS1,MT1. *Superintendent*, J.C.Pyle, B.Lit.; *Principal*, W.B.Gibson, B.A.

Smithville: E—AH,MH,EH,AmH1,Civ—M—L—P,Ph,P&H—A. *Superintendent*, W.K.Niles, B.S.; *Principal*, J.K.Barry, B.S.

Snyder: E—AH,MH,EH,AmH1—M,SG—L,Ger—P—A. *Superintendent*, D.A.Clark, B.A.; *Principal*, S.L.Rives.

South Park, Beaumont: E—AH,MH,EH,AmH—M—L—P—MT1. *Superintendent*, L.R.Pietzsch, B.A.,E.E.; *Principal*, Earl Gough B.A.

*Stamford: E—AH,MH,EH,AmH1—M,SG—L,Ger—C,P—DA1,D S1. *Superintendent*, J.W.Teasley, M.A.; *Principal*, H.F.Saunders.

Stephenville: E—AH,MH,EH,AmH1,Civ—M,SG—L—B,P,P&H. *Superintendent*, Henry Sims, M.A.; *Principal*, W.L.Spradling, B.A.

---

*On Southern List of Accredited Schools.

Sulphur Springs: E—AH,MH,AmH,Civ—M,SG—L—C,P,Ph—DA, DS, *Superintendent*, F.V.Garrison, B.S.; *Principal*, E.A.Haynie, B.S.

*Sweetwater: E—AH,MH,EH,AmH,Civ—M,SG,T—L,S3—C,P,Ph. P&H—DA,DS,MT. *Superintendent*, J.H.Bright, B.A.; *Principal*, R.N.Richardson.

Taylor: E—AH,MH,EH,AmH,Civ—M,SG—L,Ger3—C,P,Ph—D,D S,MT1. *Superintendent*, John F. O'Shea; *Principal*, J.R.Muse, M.A.

*Temple: E4—AH,MH,EH,AmH,Civ—M,SG,T—L4,Ger3—C,P,Ph Bg, ST. *Superintendent*, W.W.Clement, B.A.; *Principal*, L.C. Procter, M.A.

Terrell: E4—AH,MH,AmH,Civ—M,SG,T—L,Ger,S—C,P,Ph,P&H—Bg1,DA,DS,ST. *Superintendent*, S.M.N.Marrs, B.S.; *Principal*, J.C.Fortune, B.S.

Terrill School, Dallas: E4—AH,EH,AmH1—M,SG,T—L4,Ger3, F—C,P. *Principal*, M.B.Bogarte, B.S.

Texarkana: E4—AH,MH,EH,AmH,Civ—M,SG,T—L4,Ger—C,P, Ph,P&H—Bg1,D1,DA,DS,MT,ST. *Superintendent*, G.H.Carpenter, Ph.B.; *Principal*, C.J.Crampton.

Texas City: E—AH,MH,EH,AmH—M,SG—L—P,Ph—D,DA,DS, MT. *Superintendent*, G.L.Wren, B.A.; *Principal*, Libbie A. Breuer, B.A.

Timpson: E—AH,MH,EH,AmH,Civ—M,SG,T—L—P,Ph,P&H. *Superintendent*, Grover Hartt; *Principal*, B.M.King.

Tyler: E—AH,MH,AmH1—M,SG,T—L,Ger—C,P,Ph,P&H. *Superintendent*, T.H.Shelby, B.A.; *Principal*, H.W.Stilwell, B.A.

Uvalde: E—AH,MH,AmH,Civ—M,SG—L,S3—C,P—D,DA1,DS1,M T1. *Superintendent*, A.W.Evans, B. A.; *Principal*, P.P.Brewster, B.A.

*Victoria: E—AH,MH,EH,AmH—M,SG—L,Ger,S—B,C,P,Ph—D S,MT,ST. *Superintendent*, G.W.Page, Ph.D.; *Principal*, H. C. Baker, B.A.

*Waco: E4—AH,MH,EH,AmH,Civ—M,SG—L4,Ger3—Bi,C,P,Ph,P &H—D,DA1,DS1,MT1. *Superintendent*, B.B.Cobb, B.A.; *Principal*, E.T.Genheimer, Ph.B.,B.Lit.

*Waxahachie: E—AH,MH,EH,AmH,Civ—M,SG—L,Ger,S—C,P,Ph —D,DA1,DS1,MT1. *Superintendent*, G.B.Winn; *Principal*, P.J. Herndon.

---

*On Southern List of Accredited Schools.

Weatherford: E—AH,MH,EH,AmH,Civ—M,SG—L,Ger—C,P,Ph—Bg,DA1,DS,ST. *Superintendent*, T.W.Stanley; *Principal*, W.O. Dewees.

West: E—AH,MH,AmH,Civ—M—L—P,Ph,P&H—DS. *Superintendent*, J.P.Buck, B.A.; *Principal*, E.R.Alexander.

*Whitis School, Austin: E4—AH,MH,EH,AmH,Civ—M,SG,T—L4, Ger,F3,S—Ph. *Principal*, Miss Mary Whitis.

Wichita Falls: E—AH,MH,EH,AmH1—M,SG—L4,Ger3,S3—B,C, P,Ph,P&H—D,DA,DS,MT1. *Superintendent*, Lee Clark, B.A.; *Principal*, J.B.Jones.

Winnsboro: E—AH,MH,AmH,Civ—M,SG—L—C,P,Ph,P&H—A1, DA,DS,MT1. *Superintendent*, J.H.Sheppeard, B.A.; *Principal*, G.D.McJimsey.

Yoakum: E—AH,MH,AmH1,Civ—M,SG—L,Ger3—P,Ph. *Superintendent*, J.H.Burnett; *Principal*, M.V.Peterson, B.S.

GROUP II

(Schools in this group have at least twelve units of credit.)

Arlington: E—AH,MH,AmH,Civ—M,SG,T—L—P. *Superintendent*, J.A.Kooken; *Principal*, E.L.Cowden, B.A.

Baird: E—AH,MH,AmH,Civ—M,SG—L. *Superintendent*, J.F. Boren; *Principal*, J.N.Moseley, B.A.

Bellevue: E—AH,MH,AmH—M—L—P. *Superintendent*, I.G.McGee, B.A.; *Principal*, R.E.Petty.

Brackettville: E—AH,MH,AmH,Civ—M—L—P,Ph. *Superintendent*, T.S.Cox, B.A.; *Principal*, A.A.Berry.

Eagle Pass: E—AH,MH,AmH,Civ—M—S3—P,Ph. *Superintendent*, G.B.M.Snyder, B.S.; *Principal*, J.T.Foster.

Franklin: E—AH,MH,AmH—M—L—P . *Superintendent*, M.B. Autry.

Gilmer: E—AH,MH,AmH—M—L—C,P. *Superintendent*, I.A. Coston; *Principal*, J.R.Reid, B.A.

Goldthwaite: E—AH,MH,AmH,Civ—M—L,Ger. *Superintendent*, T.E.Gray; *Principal*, Florence Douglas.

Hearne: E—AH,MH,AmH—M—L—P,Ph. *Superintendent*, W.E. Paschall, M.A.; *Principal*, A.S.Carter, B.A.

Italy: E—AH,MH,Civ—M,SG—L—P,Ph,P&H. *Superintendent*, T.P.Mallard; *Principal*, W.E.King.

Jacksonville: E—AH,MH,EH,AmH,Civ—M—L—DA,DS. *Superintendent*, B.J.Albritton, B.A.; *Principal*, H.V.Nigro, B.A.

Jasper: E—AH,MH,AmH—M,SG—L—P. *Superintendent*, O.J. Rushing, B.A.; *Principal*, W.D.Bracken, M.A.

Lancaster: E—AH,MH,AmH,Civ—M,SG—L—P,Ph. *Superintendent*, W.C.Carroll; *Principal*, O.L.Wilkins, B.A.

Livingston: E—AH,MH,AmH1—M,SG—L—P. *Superintendent*. E.T.Murphy; *Principal*, Miss Lillian Waller, B.A.

Marble Falls: E—AH,MH,AmH,Civ—M,SG,T—S3. *Superintendent*, A.S.J. Steele.

Marfa: E—AH,MH,EH,AmH—M—S—P. *Superintendent*, W.J. B.Buttrill, B.S.; *Principal*, J.E.Gregg,B.S.

Reagan: E—AH,MH,EH—M—L—P. *Superintendent*, Ben S. Peek, B.A.; *Principal*, J.I.Moore, B.A.

Royse City: E—AH,MH,EH,Civ—M—L—P. *Superintendent*, J. S.Mendenhall, B.A.; *Principal*, W.M.Beavers.

Sinton: E—AH,MH,EH,AmH,Civ—M—S—P,Ph. *Superintendent*, J.H.Gregory; *Principal*, Arthur Gleckler, B.A.

Vernon: E—AH,MH,AmH,Civ—M,SG—L—P. *Superintendent*. T.L.Vance, B.A.; *Principal*, H.A.Baker, M.S.,Ph.B.

GROUP III

(Schools in this group have at least seven and one-half units of credit.)

Alpine: E—AH,MH,AmH1—M,SG—C,P. *Superintendent*. E.R. Bentley, B.A.

Bartlett: E—AH,MH,AmH—M. *Superintendent*. V.J.Moore, B. A.; *Principal*, G.W.Preddy.

Bishop: E—AH,MH,AmH—M,SG—C,P—MT. *Superintendent*. Alvin Dille, B.A.; *Principal*, S.L.Hardin.

Colorado: E—AH,MH,Civ—M—P. *Superintendent*. C.D.Judd B.A., B.S.; *Principal*. C.L.Bane. B.A.

DeLeon: E—AH,MH,EH,AmH—M,SG. *Superintendent*. A.R. Jarrett, L.I.; *Principal*, L.E.Forrest, B.A.

Devine: E—AH,MH,AmH,Civ—M,SG,T—P—DS1. *Superintendent*, L.H.Kidd, B.A.; *Principal*. Lula Neal, B.A.

Floydada: E—AH,MH—M—C P. *Superintendent*. F.E.Savage; *Principal*. J.E.Parks, B.A.

Giddings: E—AH,MH,Civ—M. *Superintendent*, M.A.Cannon, B.S.; *Principal*, Mary Early, B.A.

Granbury: E—AH,MH,AmH,Civ—M—P. *Superintendent*, Geo. L.Cox; *Principal*, O.R.Childress.

Granger: E—AH,MH,EH—M—L. *Superintendent*, W.H.Emert, B.A.; *Principal*, J.D.Chalk,Jr.

Milford: E—AH,MH—M,SG—P. *Superintendent*, J.A.Summerhill, B.A.,B.S.; *Principal*, L.R.Bertram, B.A

Pecos: E—AH,MH,EH—M,SG—P. *Superintendent*, J.Yoe; *Principal*, T.E.Hayden, B.A.

Powell University Training School, Dallas: E—AH,EH—M,SG—L. *President*, Nathan Powell, B.A..BD.

Sabinal: E—AH,MH,EH,AmH—M—P. *Superintendent*, T.L. Williams; *Principal*, J.E.Matthews.

State Orphan Home, Corsicana: E—AH,MH—M. *Superintendent*, W.F.Barnett.

Teague: E—AH,MH,EH,AmH,Civ—M—P,P&H. *Superintendent*, J.D.Bramlette, B.A.; *Principal*, Cora B. Linson.

Texas School for the Blind, Austin: E—AH,MH,EH,AmH1—M—S. *Superintendent*, E.E.Bramlette, M.A.; *Principal*, J.B.Gay, B.A.

Wills Point: E—AH,MH,AmH—M. *Superintendent*, C.F.Christensen.

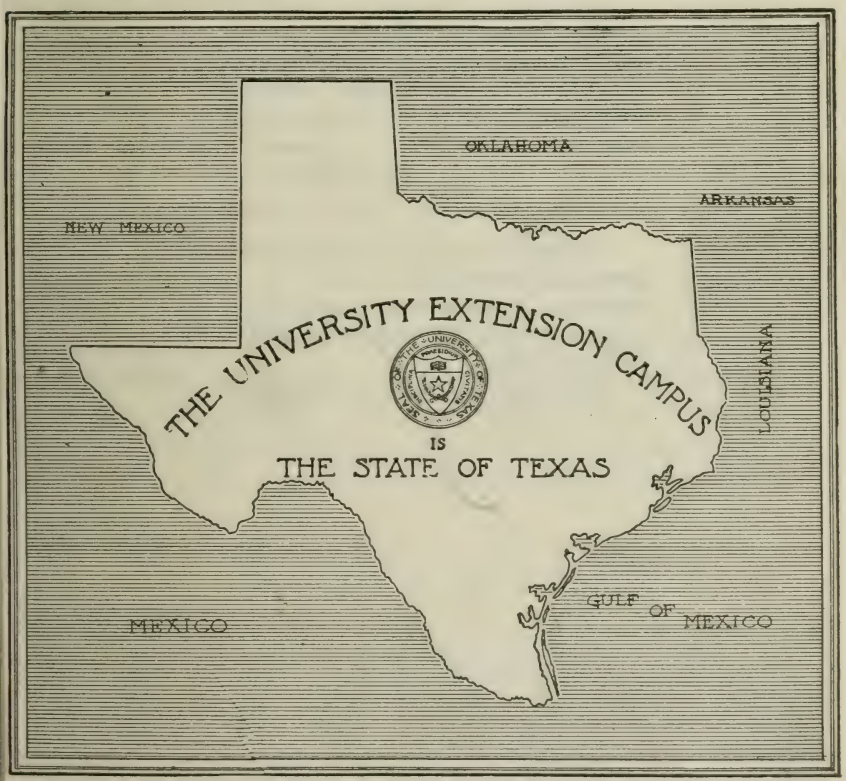
B115-717-6m

University of Texas Bulletin

No. 1726: May 5, 1917

THE EXTENSION LOAN LIBRARY
AND
LIST OF FREE BULLETINS

BY
E. S. GOREE
Extension Loan Librarian



Published by the University six times a month and entered as second-class matter at the postoffice at AUSTIN, TEXAS

The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston

Cultivated mind is the guardian genius of democracy. . . . It is the only dictator that freemen acknowledge and the only security that freemen desire.

President Mirabeau B. Lamar.

THE EXTENSION LOAN LIBRARY

Its Place Among Texas Libraries

The Extension Loan Library has a rather unique place among other libraries of the State. Texas has just taken the first step—through the passage of an adequate county library law—toward providing free books for her citizens. At the present time we have scarcely more than a hundred free and subscription libraries for four and a half million people. California, with half our inhabitants, has five times as many. Kansas, with less than two million, has twice as many. In the majority of our rural communities and small towns, debaters, club women, and teachers go to the expense of supplying their own reference and source books. It is this need that the Department of Extension recognized and tried to meet when it established the Extension Loan Library. Consequently, our patrons are the people of any Texas town or community which is without library facilities. In the three years since the Library was established, we have circulated about six thousand libraries, reaching fifteen hundred Texas communities. Since each library is used by more than one person, as a rule, it is difficult to estimate the real number of our patrons. The demand constantly outgrows its maintenance fund. For this reason, requests coming from students of other colleges, or from residents of towns maintaining good public libraries are referred to their respective librarians.

The "Package" Library Plan

The Extension Loan Library is not a conventional library with rows of nicely bound books on all subjects, and covering all periods of the world's history. The so-called "libraries" are packages of clippings, periodical articles, and pamphlets, all on the same subject. We try to send in each package enough material to enable a team to get up a debate, to provide subject matter for a club discussion, or an institute paper or address. Our patrons are debaters, club women, farmers, home-makers,

teachers, and business men and women. The libraries are usually of parcel post size, and the cost of sending varies from eight to twenty cents. The subjects on which we are able to supply material are questions of current interest and importance, the kind of question naturally chosen for debates, addresses, etc.

Building of Libraries

We have very few books. Instead, our shelves are lined with pamphlet boxes, classified by subject, and filled with newspaper and periodical articles, and pamphlets on the subject indicated outside. The library receives by gift, exchange, or subscription three daily papers, and a hundred weekly and monthly periodicals. The newspapers are read daily and articles on public questions are clipped and filed away. The periodicals listed in *Reader's Guide to Periodical Literature* are shelved and the articles are read and clipped as they are needed. Smaller periodicals, not indexed in the *Guide* and the contents not readily available, are read, clipped, and classified as quickly as possible, and the waste sections discarded. The Library is housed in one room in the Extension "shack," and necessary space for the storage of accumulated material requires careful planning.

In addition to the material collected from newspapers and magazines, the librarian keeps in touch with various organizations, and bulletins and propaganda material on numerous topics, particularly on Social Service, Peace, Preparedness, Education, Prohibition and kindred subjects are secured from such sources. Much valuable material is secured by exchange from other colleges and universities, and from the State Agricultural Experiment Stations. These pamphlets also are classified and filed away, and libraries are made up according to the demand.

It may readily be seen that the material collected from the sources indicated is usually of present-day interest, and is non-technical in character. We cannot often supply articles on abstract subjects. A glance at the table of contents of a number of current magazines will reveal very few articles on subjects like "Life Is a Vapor," "Climb, Though the Way Be Rugged," "Be a Blessing," etc. Technical and historical matters of long

established interest are treated more thoroughly in books, so we do not attempt to supply libraries on such subjects. Through the co-operation of the Librarian and the Library Committee of the University Library, we are sometimes able to meet such demands by borrowing from the University Library.

Supplementary Use of Books

The Extension Librarian is allowed to borrow books for out-of-town patrons on the same conditions governing people who live in Austin but are not connected with the University. The terms are rather more generous than those on which students use the library. Students pay five dollars *each year,* and four dollars minus fines and damages is returned at the end of the year. The non-University patron pays five dollars which covers the entire term of usage, even though it extend over several years, and the five dollars minus fines and damages is returned when the borrower wishes to withdraw from library privileges. To out-of-town patrons the librarian has extended another courtesy. If the request is made through the librarian of your city library, or through the superintendent or principal of your school, who will assume the responsibility of the loan, books not in use in the library may be sent out of town. Superintendents and principals have shown themselves very willing to aid in the cause of library extension, and through their kindness many books from the University Library have been circulated throughout the State. It is understood that books in demand by faculty or students are not available to other borrowers, and all books sent out are subject to recall if they are needed in University work.

Rules for Borrowers

The rules for borrowers are few and very simple. We have no way of enforcing them except by refusing requests from people who persistently ignore them. However, the spirit of co-operation and interest shown by our patrons whom we rarely meet except through the medium of the U. S. mail is excellent,

and our "black-list" is very short. The staff of the library is glad to express appreciation to the many patrons who in returning material and postage take the time to tell us how nearly the material sent filled the purpose for which it was requested. Your suggestions are received gladly. They have a higher value than you know.

The brief rules are as follows:

1. Libraries are loaned for two weeks; they may be renewed on request of the borrower if there is no outstanding order.
2. The borrower pays the postage both ways.
3. More than two libraries may not be sent to one borrower at the same time. *Always indicate a second choice in case the first is out.*
4. Debating material must be borrowed by the *teacher* or by the president or secretary of the debating society. *Two* libraries on a subject is sufficient to supply the several members of a team. It reduces our material unnecessarily to have each member of the team ask for a separate library.
5. Do not enclose notes, letters, etc., in the libraries. It makes the material subject to letter rates.
6. In returning libraries, do not roll or fold articles. Wrap the package securely, and write your name and address on the package.

Typewritten Articles

We have an increasing number of calls for selections for declamations, or special articles not in our files. When the articles requested were available in the University Library but could not be sent away, we have supplied typewritten copies. In the future the additional expense of this service will have to be paid by the borrower instead of the Library. The charge is 20c for a single-spaced page of typewritten copy.

About Postage and the Wrapping of Packages.

Perhaps an additional explanation about postage will help to minimize delays and misunderstandings. Unbound articles and pamphlets are classified by the Postal Department as "printed matter," and less than four pounds of it must be sent at third class rates, or half a cent an ounce. Books, and printed matter to the amount of four pounds, is sent at parcel post rates. Sometimes we add to a library of printed matter a few of the free bulletins published by the University in order to bring the weight of a library up to four pounds, and thus reduce your postage. If you find these bulletins interesting we are glad for you to keep them. University of Texas bulletins marked "Out of Print" and having library classification marks in the upper left hand corner should be returned. Much inconvenience and unnecessary expense will be saved by care in wrapping packages for return. Typed articles, unless mimeographed or neostyled, must be sent in separate envelopes with the usual letter rate postage. Notes scribbled on the manila covers, scraps of paper containing outlines for your paper, or points on your debate all subject the entire package to first class rates, or two cents an ounce, if the library is opened by the postmaster. Several times we have had to pay from fifty to ninety cents to get a library out of the postoffice. In such cases we ask the borrower to refund the postage.

Another thoughtless practice is that of returning libraries unwrapped, but with the stamps and address placed on the manila pamphlet covers. Each library is circulated a number of times, and manila is expensive. Will you help us keep our material fresh and clean for other users?

One or more libraries have been prepared on the following subjects. In addition we have some miscellaneous material, and many biographical articles from which we are sometimes able to respond to calls for material not listed.

LIST OF SUBJECTS ON WHICH PACKAGE LIBRARIES CAN BE SUPPLIED

(Other subjects are constantly being added)

Ability Tests for Children
Academic Freedom
Accidents, Industrial
Accounting
Actors and Actresses
Adamson Act
Advertising
Agricultural Clubs (For Boys and Girls)
Agricultural Credit
Agricultural Education
Agricultural Pests
Agriculture, Economic Aspects
Agriculture, Cooperative
Alaska
Alcohol
Alfalfa
American Literature
American Poetry
Arbitration, Industrial
Archaeology
Architecture, Domestic
Argentina
Armed Merchant Ships
Armies, U. S.
Art, American
Art, European
Art, Study and Teaching
Arts and Crafts
Automobiles
Aviation
Backward Children
Balkan States
Banks and Banking
Bees
Belgium
Birds, Protection of
Books and Reading
Boy Scouts
Brazil
Bread
Budget, National
Budget, Household
Business Management Organization
Campfire Girls
Canning and Preserving
Canning Clubs
Capital and Labor
Capital Punishment
Central America
Child Labor
Chile
China
Christmas
Cigarettes
Citizenship
City Manager Plan
City Planning
Civic Organizations
Civil Service
Classical Education
Clothing and Dress
College Athletics
College Women
Colleges and Universities

Compulsory Education
Conscription
Conservation of Resources
Contagion and Contagious Diseases
Convict Honor System
Cookery
Co-operative Stores
Corporation Schools
Cost of Living
Cotton
Country Church
Country Life
County Libraries
Courtesy
Crime and Criminals
Cuba
Dairying
Debating
Defectives
Dependent Children
Diplomacy
Divorce
Domestic Animals
Domestic Science in Schools
Drama, American
Drama, European
Drug Habit
Education
Education, Elementary
Education, Secondary
Efficiency
Eight-hour Law, Railroad
Electricity in the Home
Embargo
Employment Agencies
England (Present)
Entertaining
Eugenics
European War, Atrocities
European War, Causes
European War, Leaders
European War, Relief Work
European War, Results (Forecasts)
Evening and Continuation Schools
Feeble-Minded
Fiction, American
Fiction, European
Flies
Flowers
Folklore
Food Supply
Food Adulteration
Forests and Forestry
France (Present)
Free Trade and Protection
Fruit Culture
Furniture
Gardens, Market
Gary System
Germany
Government, National and State
Government Ownership
Greenhouses and Cold Frames
Handicraft
Heredity
High School Libraries
High Schools
Hours of Labor
House Decoration
Hygiene
Illiteracy
Immigrants in U. S.
Immigration, Literacy Test

Indians
Industrial Education
Industrial Research
Infants, Care and Hygiene
Initiative and Referendum
International Law
Ireland
Japan
Japanese in the U. S.
Jews
Journalism
Junior High Schools
Justice, Administration of
Juvenile Courts
Juvenile Delinquency
Kindergarten
Labor and Capital
Landscape Gardening
Latin America
League to Enforce Peace
Libraries, Public
Lynching
Manual Training
Marketing
Merchant Marine
Mexico
Military Service, Compulsory
Military Preparedness
Military Training
Minimum Wage
Mines and Minerals
Monroe Doctrine
Montessori Method
Mothers' Pensions
Moving Pictures
Munitions of War
National Forests and Parks
Negroes, Education
Old Age Pensions
Open and Closed Shop
Opera
Pageants
Panama Canal
Pan-Americanism
Parcel Post
Parent-Teacher Associations
Peace
Pellagra
Peru
Philippine Islands
Physical Education
Playgrounds
Poultry
Presidential Messages
Presidential Primaries
Prison Reform
Prohibition
Public Health
Public Schools
Railroads
Rats
Recall
Red Cross
Religious Education
Roads
Rural Schools
Russia (Present)
Salesmen and Salesmanship
School Buildings
School Credits
School Entertainments
School Gardens
School Hygiene
School Libraries
School Lunches
Schoolhouses as Social Centers

Servants
Sexual Hygiene
Short Ballot
Short Story
Single Tax
Smith-Lever Law
Social Work
Socialism
Soils
South, The
Story-Telling
Strikes
Submarine Warfare
Switzerland
Tariff
Taxation
Teachers' Homes
Teaching
Texas
Textbooks
Theater
Thrift
Trade Unions
Trusts
Tuberculosis
Typhoid Fever
Unemployment
Vacations
Vegetable Gardening
Venezuela
Vers Libre
Vivisection
Vocational Guidance
Wages
War
West Indies, Danish
Woman
Woman Suffrage
Women's Clubs
Workmen's Compensation
Y. M. C. A.
Y. W. C. A.

List of Free Bulletins

(Prices mentioned for certain bulletins are for out-of State residents)

No.	*Name of Bulletin*	*Date*
284	Intercollegiate Debates on Old Age Insurance, Banking and Currency Reform, 15 cents....	1913
286	Texas' Need of the Services of Higher Education. Prize orations in the State oratorical contests, 1913, 15 cents.....	1913
347	Meat, Its Value as Food and Its Proper Preparation	1914
348	Seasonable Fruits and Their Uses.....	1914
350	The Irish Potato.....	1914
355	Co-operation in Agriculture, Marketing and Rural Credit	1914
361	Nature Study and Agriculture for the Rural Schools of Texas.....	1914
366	Nuts and Their Uses as Food.....	1914
16	A Selected, Classified List of Free Publications on Agriculture and Allied Subjects for Use in the Home and School.....	1915
30	A Constitutional Tax for the Support of Higher Educational Institutions in Texas, 15 cents...	1915
31	Woman Suffrage. (Bibliography and Selected Arguments), 15 cents.....	1915
32	Play and Athletics.....	1915
33	Athletic Rules of the Interscholastic League.....	1915
35	School Literary Societies.....	1915
52	Study Outlines of Elizabeth Harrison's "Child Nature"	1915
53	Study Outline of Tyler's "Growth and Education"	1915
54	Study Outlines of Carney's "Country Life and the Country School".....	1915
55	Study Outlines in Home Economics.....	1915
59	Cover Crops	1915
66	Poultry on the Farm.....	1915

No.	*Name of Bulletin*	*Date*
48	Care and Preservation of Food in the Home	1915
2	Labor Saving Devices in the Farm Home	1916
4	How to Conduct a Baby Health Conference	1916
16	Schoolhouse Meeting: School Closing Exercises	1916
17	The Beautification of the Home Grounds	1916
23	Announcement of Correspondence and Group Study Courses	1916
26	The Furnishing and Decoration of the Home	1916
39	The Planning of Simple Homes	1916
41	Military Preparedness	1916
42	What Help the Teacher Can Get From the University Extension Department	1916
47	Single Tax, 15 cents	1916
52	Selected Words for Spelling Matches	1916
56	Programs for Schoolhouse Meetings	1916
62	Universal Military Training, 15 cents	1916
67	A Study of Rural Schools in Travis County, Texas	1916
72	A Play for San Jacinto Night	1916
1706	Suggestions for Infant Feeding	1917
1707	Food for Growing Children	1917
1708	What the Baby Health Conference Teaches	1917
1709	Why Register Births and Report Cases of Sickness	1917
1711	Pure Milk and How to Get It	1917
1716	The Principles of Menu Making	1917
1717	School Savings Banks	1917
1720	Uses of the Peanut on the Home Table	1917
1721	Constitution and Rules of the University Interscholastic League	1917
1726	The Extension Loan Library and List of Free Bulletins	1917
1729	Beginning a Country School	1917
1730	Visual Instruction Through Lantern Slides and Motion Pictures	1917
1731	Yeast Bread and its Variations	1917

Address requests for bulletins to the Bulletin Clerk, Department of Extension, University, Austin, Texas.

B113-717-3m

University of Texas Bulletin

No. 1727: May 10, 1917

Cotton Seed Flour as a Human Food

By

ANNA E. RICHARDSON

Adjunct Professor of Home Economics

Recipes by

JENNIE R. BEAR

Instructor in Home Economics

Published by the University six times a month and entered as second-class mail matter at the postoffice at AUSTIN, TEXAS

The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston

Cultivated mind is the guardian genius of democracy. . . . It is the only dictator that freemen acknowledge and the only security that freemen desire.

Mirabeau B. Lamar

COTTON SEED FLOUR AS HUMAN FOOD.

Food Shortage. It is well known that the United States faces a very serious food situation. Not only is there a great shortage in our staple articles of food, wheat, potatoes and meat as is shown by a comparison of the government reports for the past few years, but the demands upon our food supply have vastly increased. When the United States entered the war we assumed the burden of supplying a large part of the food of our allies as well as of Belgium and the neutral nations. This burden, plus our shortage of crops, forces us to utilize as never before every available food stuff.

Cotton Seed Products. The South has an almost untouched source of food in cotton seed. The United States raises each year an enormous crop of cotton and until only a few years ago the fiber was the sole marketable product, while the seed was considered practically a waste. The great wealth stored up in the kernel of the cotton was later recognized and we have had cotton seed oil in a variety of forms on the market, and the resultant cake or meal used to a limited extent for cattle feed for a number of years. Only recently, however, has there been any attempt to manufacture an edible product from the cotton seed meal.

Cotton Seed Flour. After some experimentation, improvements in the milling of the cotton seed meal were devised and we now have on the market a very palatable brand of cotton seed flour. In its manufacture the kernel has been subjected to a roasting process and the meal has been highly bolted with the result that the greater part of the protein and fiber have been removed and a light colored flour of fine texture and of a pleasant nutty flavor is produced.

Composition of Cotton Seed Flour. The analysis of the cotton seed flour as furnished by G. S. Fraps, Chemist, Texas A. and M. College, is as follows:

Protein	51.19
Fat	11.40
Crude fiber	3.05
Nitrogen-free extract	22.22
Water	6.14
Ash	6.00

A study of these figures reveals at once the vast amount of available food stuff which the cotton crop of Texas alone can furnish to the world.

Cotton seed flour is very rich in protein, the food principle essential to growth and proper repair of the body. From the results of nutritional experiments in which white rats were given diets whose sole source of protein was cotton seed flour, it was found that cotton seed flour furnished not only an adequate protein for normal growth, but that reproduction was possible and on such diets four normal generations of rats have been raised. The protein of cotton seed flour seems unusually efficient. For an ordinary mixed diet the rats are fed about 25 per cent protein. While on cotton seed flour diet normal growth and reproduction is secured by 18 per cent protein. Cotton seed flour is a valuable source of fat in the diet, and in the light of the great shortage of animal fats will prove a most important source of food.

Cotton seed flour contains no starch and is a valuable food for those who are unable to utilize starch, and who are consequently on a starch-free diet.

The nitrogen-free extract is in the form of sugar, gums and resins.

The most abundant ash constituents of cotton seed flour are phosphorous and potassium, both of which are essential to the normal growth of the body.

Prejudice Against Cotton Seed as a Food. Cotton seed flour has been used as a standard article of diet by some people for a number of years, but it has not been used generally by the public owing to the fact that its fitness for food has been questioned because of the ill effects resulting from the feeding of it to cattle and hogs.

Toxicity of Cotton Seed Flour. Careful feeding experiments with cottoi seed flour, covering a long enough period of time, have not been performed with humans to enable us to draw any final conclusions, but a great number of feeding experiments with animals have been made. There is scarcely a state experiment station that has not done work on this subject. All of the reports agree in the value of the use of cotton seed meal as stock

food, but they do not agree as to the amounts to use nor the combination of foods giving the best results. In many of these reports we find evidence of a diet which is unfitted to the needs of the animals and in some cases evidence of possible poisoning as is proven by the death of the animals.

In the last few years a great deal of attention has been directed to the proper balancing of diets both from the standpoint of the proper proportion of the essential food principles, protein, fat, and carbohydrates; and also in respect to other essential food accessories not so well understood, yet apparently very important from the standpoint of proper nutrition. The late work done upon cotton seed meal indicates strongly that the bad results obtained from feedings are not due to a poisonous substance in the meal, but are due to the feeding of a diet lacking some one or more essential to proper nutrition.

December, 1915, we have a report of the work of Rommel and Vedder[1] in the United States Bureau of Animal Industry, in which they say: "The United States uses only part of the cotton seed meal which it produces and one of the reasons which prevents a larger domestic consumption of this by-product of the cotton industry is the danger that sickness and death may follow its use. Cattle fed for more than 90-120 days on a heavy cotton seed meal ration become lame, eyes discharge and often blindness results. Pigs are peculiarly susceptible." The symptoms cited by various experimenters were so similar to the symptoms of beriberi that Rommel and Vedder conducted experiments to compare the effects of feeding polished rice and cotton seed meal. At the time the article was published the pigs had been on the diets 90 days, all were sick with the same symptoms. The conclusions drawn for their report[2] were as follows:

1. Pigs are susceptible to beriberi when fed a vitamine-deficient ration.

2. So-called cotton seed poisoning is a deficiency disease analogous to the disease known as beriberi, if not indeed identical.

3. The cause of the so-called cotton seed poisoning is probably

---

[1]Rommel, G. M., and Vedder, E. B., Agric. Research, 1915, V. 489.

[2]Rommel, G. M., and Vedder, E. B., J. Agric. Research, 1915, V. 489.

a deficiency in the ration causing profound changes in the nervous system. The grain with which cotton seed is usually combined is corn and must be balanced to be fed satisfactorily. When corn meal is fed with cotton seed a combination is made of two deficient foods.

October, 1916, a report was published by Wells of the Georgia Agricultural Experiment Station.[3] In this paper Wells says: "Our experiment in feeding cotton seed meal to pigs shows that it is necessary to balance the ration, not so much as to the nutritive ration determined by the amount of fats, carbohydrates and proteins present, but rather as to the so-called accessory food factors." His conclusion is that cotton seed injury is due to inadequate diet.

The same year the nutrition laboratory of the School of Home Economics of the University of Texas published the results of feeding experiments with cotton seed flour on white rats.[4] The result of this work showed conclusively that rats could be grown and that they would reproduce normally to the fourth generation upon diets one-half of which was cotton seed flour, but that rats would neither grow normally nor reproduce upon diets containing cotton seed flour but lacking some essential constituent. These results in no way suggest the presence of a poisonous substance, but rather that cotton seed flour is an adequate food when fed in a well-balanced diet and that the so-called cotton seed poisoning is due to deficiencies in the diet rather than to an active toxic substance. Later work on rats by Osborne and Mendel[5] has substantiated the results reported by the University with white rats.

The results of these experiments seem to justify the use of cotton seed flour as a part of a well-balanced diet.

Cotton Seed Flour as a Meat Substitute. Cotton seed flour is 50 per cent protein while wheat flour is 10-12 per cent protein. In its composition cotton seed flour approaches more

---

[3]Wells, C. A., Ewing, P. V., Georgia Agricultural Exp. Station, Bull. 119, 1916.

[4]Richardson, A. E., and Green, H. S., J. Biol. Chem., 1916, XXV.

[5]Osborne, Thos. B. and Mendel, Lafayette B., J. Bio. Chem. 1916, XXIV.

nearly meat, whose protein content is from 12 to 20 per cent. and although it is used in mixtures as a substitute for wheat flour, it should be remembered that when using cotton seed flour the amount of meat in the diet should be cut down. In this flour we thus have a substitute both for the fast disappearing wheat flour as well as for the equally scarce meat of the diet.

Co-efficient of Digestibility. In determining the efficiency of a substance for food it is important that we determine the amount of it that is digestible, for a substance is of little account as food that cannot be well utilized by the body.

From the results of experiments on men with cotton seed meal Rather[6] found that the digestibility of the protein of cotton seed flour was 78.4 per cent. The figures for fat were not so accurate but fat is probably quite completely digested.

To further investigate this question a series of five digestive experiments were made in the Nutrition Laboratory of the University of Texas on women. The experiment lasted five days and was divided into a two day preliminary and a three day experimental period. The diet during the five days was made up of cotton seed flour in combination with corn meal, butter, sugar and grape juice. In this diet 100 grams, about 3½ ounces, of cotton seed flour was eaten. The amounts eaten were carefully weighed and the end products of digestion were collected and analyzed. The result of this series of five experiments gave an average digestibility for the protein of cotton seed flour to be 85 per cent. The result of these experiments place cotton seed flour with other cereals and bread stuffs which according to the Atwater figure contain 85 per cent digestible protein and shows clearly the great importance of cotton seed flour as a source of vegetable protein.

Uses of Cotton Seed Flour in Cookery. The Foods Laboratory of the School of Home Economics worked out a number of satisfactory recipes for the use of cotton seed flour in cookery. The flour cannot be substituted entirely for wheat flour, but can replace to advantage one-fourth to one-third of the wheat flour in all recipes where flour is used, and thus conserve our short supply of wheat.

---

[6]Rather, J. B., Texas Agric. Exp. Station., Bull. 163, 1913.

In cake mixtures it was found that the amounts of sugar could be reduced one-fourth on account of the sweetness due to sugar present in the cotton seed flour, so its use means not only a saving of wheat flour, but of sugar as well, another of our scarce and high priced foods.

COTTON SEED FLOUR RECIPES.

Cotton seed flour has a very high per cent of protein or tissue building material. It has more than twice as much protein as meat, and when used in the diet should be substituted for part of the meat.

It can replace to advantage one-fourth to one-third of the wheat flour in all recipes where flour is used, and thus conserve our rapidly decreasing supply of wheat.

Cotton seed flour breakfast food:

¼ cup cotton seed flour,
¾ cup corn meal,
⅓ teaspoon salt,
4 cups boiling water.

Mix flour and corn meal together. Stir this into boiling salted water. Allow to boil for ten minutes, stirring constantly. Cook over boiling water for forty minutes. This may be served with cream and sugar, or moulded in pans one inch deep. When cool cut in squares, roll in crumbs and brown in fat.

Baking powder biscuit:

⅔ cup cottonseed flour,
1⅓ cup wheat flour,
2 tablespoons Wesson oil,
½ teaspoon salt,
¾ cup milk.

Add the oil to the milk, and stir into the flour into which the salt and baking powder have been sifted.

Muffins:

3 tablespoons Wesson oil,
¼ cup sugar,
1 egg,
¾ cup milk,
1½ cup flour,
½ cup cotton seed flour,
4 teaspoons baking powder.

Add the oil, sugar and beaten eggs to the milk. Beat the milk into the flour and baking powder. Bake in gem pans or in sheets, and cut in squares.

Boston brown bread:

1 cup corn meal,
1 cup graham flour,
1 cup cotton seed flour,
1 cup molasses,
1½ cup sour milk,
1 teaspoon soda,
½ teaspoon salt.

Sift soda and salt with the cotton seed flour. Add molasses to the sour milk and stir the dry ingredients into the liquid. Fill buttered pound baking powder tins ⅔ full. Tie buttered lid down firmly. Steam for three hours. An additional cup of corn meal may be used in place of the graham flour.

Light bread:

1 cup buttermilk,
1 tablespoon fat,
½ tablespoon sugar,
3 cups white flour,
1 cup cotton seed flour,
1½ teaspoon salt,
¼ Fleischman's yeast cake,
2 tablespoons water.

Make a sponge of the buttermilk, fat, sugar, 2 cups of flour, and the ¼ yeast cake softened with 2 tablespoons of cold water. When this sponge has doubled in bulk, add the remaining flour until stiff enough to knead. Knead until it no longer sticks to the board. Set to rise. When doubled in bulk form into a loaf and bake. This bread may be made with water or sweet milk. The acid buttermilk, it is thought, gives a more tender loaf. It is best to use more yeast with cotton seed flour bread than with wheat flour bread.

Luncheon rolls:

Add one tablespoon sugar and one tablespoon butter to the above recipe when making stiff. When it has doubled in bulk roll to about ¼ of an inch in thickness. Cut with a biscuit cutter. Make into pairs by brushing one lightly with butter or other fat, and placing another on top. When they have doubled in bulk place in a very hot oven.

USES FOR COTTON SEED FLOUR BREAD CRUMBS.

English pea loaf:

1 cup pea pulp,
¼ cup chopped onion,
¼ cup chopped nuts,
1 egg,
Salt and sage,
Toasted cotton seed flour bread crumbs,
1 tablespoon Wesson oil.

Brown onions in oil, add to beans, nuts, and eggs, thicken with bread crumbs. Place in buttered pan and bake about forty-five minutes. Serve with tomato sauce.

Potato and nut loaf:

1 large raw potato or 2½ cups cooked rice,
1 cup chopped nuts,
1½ cup cotton seed bread crumbs,
2 eggs,
1 small onion,
1 cup hot water,
Salt,
1 pint strained tomatoes.
2 tablespoons butterine, Wesson or peanut oil.

Grind the nuts, onions, and raw potatoes together, add the hot water and crumbs. Pour the tomato juice over it, and baste as it bakes.

Navy bean croquettes:

½ cup chopped nuts,
¼ cup cotton seed flour bread crumbs,
2 eggs,
1 teaspoon lemon juice, salt, and cayenne pepper,
1 cup bean pulp.

Mix well, shape into croquettes, roll in bread crumbs, in egg beaten with one tablespoon of water to each egg, and again in crumbs. Brown in fat. The bread crumbs may be made from bread in which one-fourth of the flour is from cotton seed. The color is not so beautiful, however, as when white flour is used.

Split pea croquettes:

1 cup pea pulp,
1 egg,
6 tablespoons cotton seed bread crumbs,
2 tablespoons chopped onion,
1 teaspoon chopped parsley,
Few brains cayenne pepper, thyme, salt and baking powder.

California bean croquettes:

1 cup bean pulp,
1 tablespoon cotton seed bread crumbs,
1 tablespoon finely chopped onion,
2 tablespoons egg,
Few grains cayenne pepper, salt and baking powder.

Scrapple:

Cook scrap meat until tender, and grind. To ⅔ cup meat, ⅓ cup of cotton seed flour and ⅔ cup corn meal, add 3 cups of water, ⅔ teaspoon salt and one small onion chopped fine. Cook in a double boiler thirty minutes. This may be browned in a skillet, or when the mush is cold it may be molded into a loaf, basted with tomato juice and baked. It should be served with a tomato sauce. If a meat broth is used instead of water the corn meal and cotton seed flour may be doubled without increasing the quantity of meat. The meat is really used for flavoring.

Rolled Wafers:

¼ cup butterine,
6 tablespoons powdered sugar,
½ teaspoon vanilla,
Few grains of salt,
¼ cup cream,
9 tablespoons flour,
5 tablespoons cotton seed flour.

Add cream drop by drop to the creamed butter and sugar, then add flour, flavoring and salt. Spread very thin over buttered bottom of inverted pan. Mark in squares and bake in a hot oven. Separate squares and roll. This may be sprinkled with chopped nuts before baking. (Make thirty wafers.)

Eggless cake:

¾ cup sugar,
½ cup butter
1 cup sour milk,
1⅓ cup flour,
⅔ cup cotton seed flour,
1 cup chopped raisins,
1 teaspoon soda,
1 teaspoon cinnamon,
½ teaspoon cloves,
1 teaspoon lemon extract.

Mix and sift the dry ingredients. Add alternately with milk, to the creamed butter and sugar. Bake in a moderate oven for an hour.

Pie Crust:

⅓ cup fat,
1 cup cotton seed flour,
⅔ cup white flour,
⅓ teaspoon salt,
Ice water.

Cut in half fat and roll in half. Cool well before baking.

Cheese straws:

Excellent cheese straws are made by rolling into the paste made from the pie crust recipe ⅓ cup of cheese. Roll one-eighth of an inch thick, and cut in strips about three inches long. Place these straws on the inverted bottom of a biscuit pan and bake until crisp.

University of Texas Bulletin

No. 1730: May 25, 1917

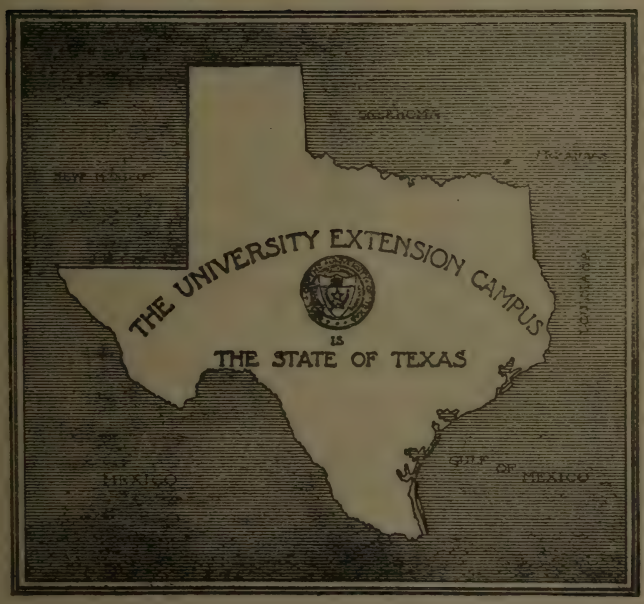
Visual Instruction Through Lantern Slides and Motion Pictures

BY

N. L. Hoopingarner

AND

G. S. Wehrwein



Published by the University six times a month and entered as second-class matter at the postoffice at AUSTIN, TEXAS

Publications of the University of Texas

Publications Committee:

F. W. Graff
J. M. Bryant
D. B. Casteel
Frederic Duncalf
R. H. Griffith
J. L. Henderson
I. P. Hildebrand
E. J. Mathews

The University publishes bulletins six times a month, so numbered that the first two digits of the number show the year of issue, the last two the position in the yearly series. For example, No. 1701 is the first bulletin of the year 1917. These comprise the official publications of the University: publications on humanistic and scientific subjects, bulletins prepared by the Department of Extension and by the Bureau of Municipal Research, and other bulletins of general educational interest. With the exception of special numbers, any bulletin will be sent to a citizen of Texas free on request. All communications about University publications should be addressed to the Editor of University Publications, University of Texas, Austin.

B136-917-3m

University of Texas Bulletin

No. 1730: May 25, 1917

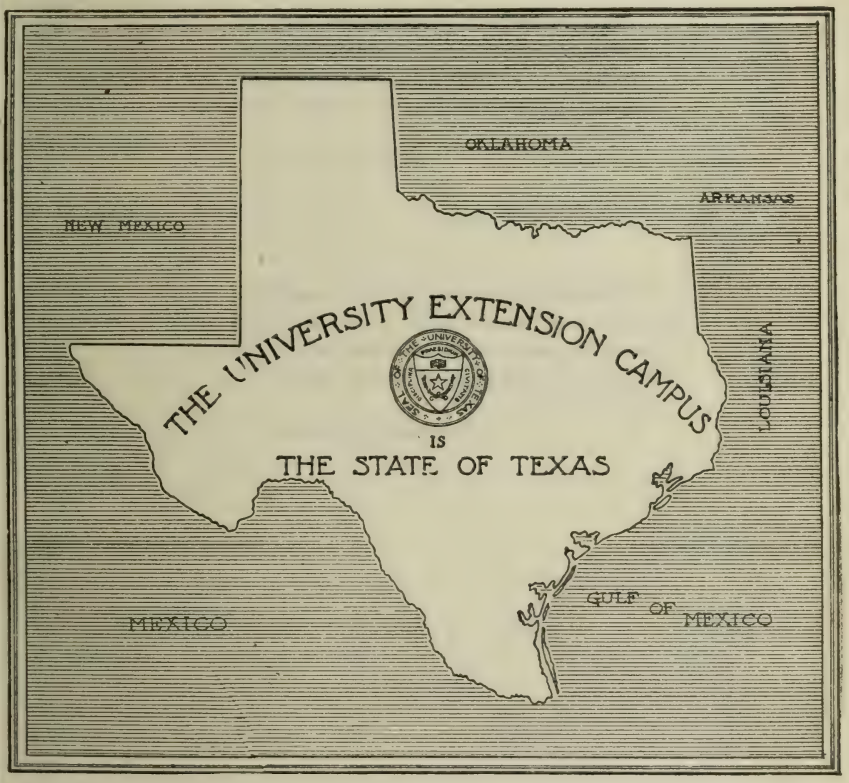
Visual Instruction Through Lantern Slides and Motion Pictures

BY

N. L. Hoopingarner

AND

G. S. Wehrwein



Published by the University six times a month and entered as second-class matter at the postoffice at AUSTIN, TEXAS

The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston

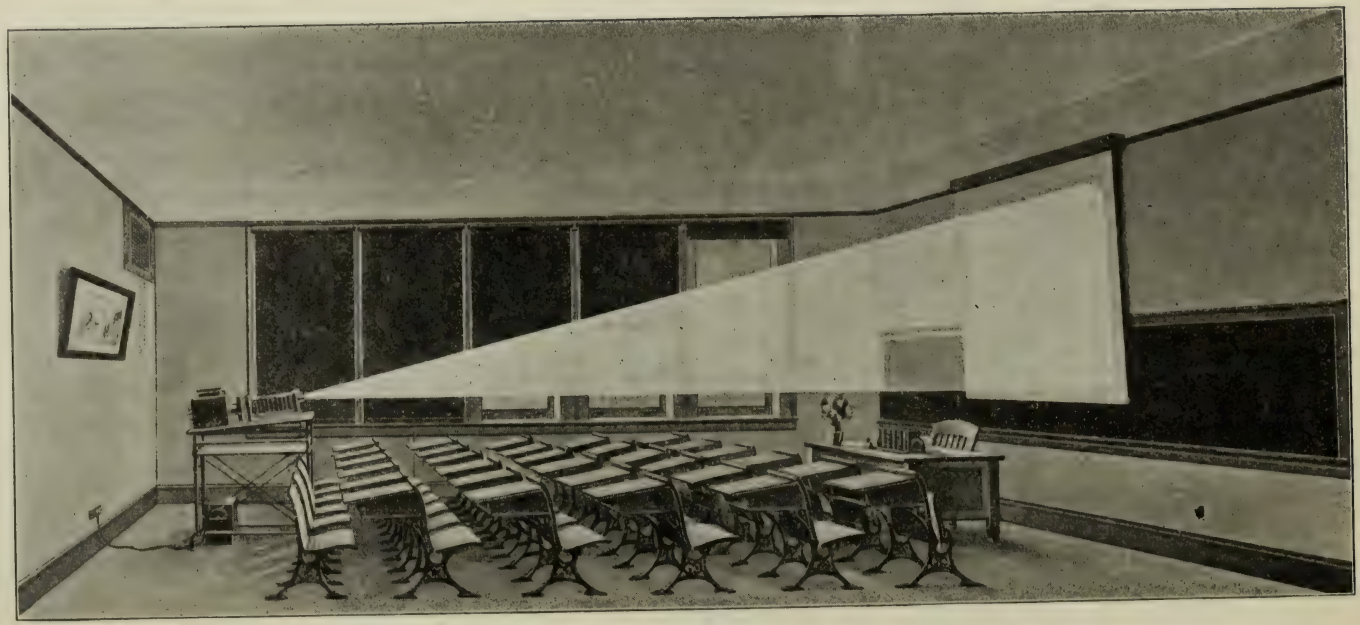
Cultivated mind is the guardian genius of democracy. . . . It is the only dictator that freemen acknowledge and the only security that freemen desire.

Mirabeau B. Lamar

PREFATORY NOTE

Since the establishment of Extension Work in Visual Instruction through lantern slides, and more recently through motion pictures at the University of Texas, many inquiries have been received concerning slides, manipulation of lanterns, where to obtain slides, the conditions under which slides are loaned, and many other details. The purpose of this bulletin by Mr. Wehrwein and Mr. Hoopingarner is to answer in a brief, concise form, many of these questions; to bring before teachers and others the value of Visual Instruction; to show how lantern slides and motion pictures can be used for entertainment and in class-room work and in what way the Department of Extension of the University can be of service to the people of Texas in this respect. The Department is planning materially to increase its library of lantern slides and motion picture films in the near future. Supplementary lists in addition to those contained in this bulletin will be sent upon application.

J. W. Shepherd, Acting Head of
Division of Visual Instruction.



TYPICAL SCHOOLROOM WITH LANTERN EQUIPMENT

The illustration shows accurately the method of darkening the room, the small screen attached to picture molding to avoid defacing of wall, movable metal stand, lantern connected by short cable with electric circuit

Courtesy American School Board Journal

VISUAL INSTRUCTION

"Give a child objects, something that can be visualized, let him see it with his own eyes, and it is astounding how rapidly that child will learn," said Thomas A. Edison, in speaking of visual instruction. "Teach things, not words," is another way of saying the same thing; and the experiments in science, in agriculture, and the actual work in manual training and domestic science show that we are getting away from mere "book learning." Even the older subjects are being vitalized. In arithmetic, the teacher uses objects in number work, peck and quart measures in denominate numbers, and has the pupils measure the school house and the yard when teaching linear and square measures. Many schools are making collections of woods, seeds, flowers and soils, and the geography and history classes visit places of geographical or historical interest in the community.

Where opportunity for actual observation is lacking, pictures must be used. Geography, literature, history, art—and other subjects, perhaps to a less degree—need pictures to make them realistic. Without pictures, rivers are mere black lines across a map instead of surging streams, and, to a child of the prairie, mountains are mere crooked marks. Teachers ought to make collections of such illustrative material from magazines, old books, or from picture companies. These pictures can be mounted on a bulletin board in the school room or used for class study. But for class work the teacher ought to have pictures of sufficient size to be seen by the whole class. Mere sketches and diagrams can be placed on the blackboard or put on large sheets of paper or on cloth in the form of charts, but showing a large picture is a more difficult proposition. The many expensive "charts" sold to schools to teach agriculture, physiology, physical geography, and even the common branches show the attempts to fill this need.

Lantern Slides and Motion Pictures.—The need for large illustrations in "visual instruction" is met by lantern slides. These are "condensed pictures," small in bulk, easily transported and can be shown wherever a curtain can be hung and a room dark-

ened. They are especially adapted to classroom needs. The pictures on the screen are large enough to be seen by the entire class. With a picture showing a Philippine village on the screen the teacher can call attention of the whole class to the houses, the customs, and occupation of the people. He can show the tropical vegetation, mountains, rivers, and other natural features in a most vivid and natural manner. The camera has been able to "catch" the whole scene and now the stereopticon recreates it for spectators thousands of miles away, ofttimes in natural

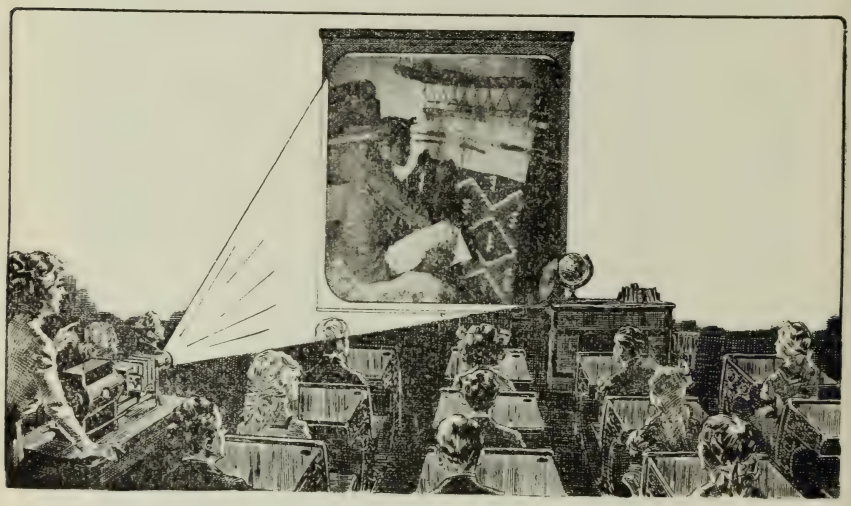


FIGURE I

"Visual Instruction in the Class Room."—Courtesy of Underwood and Underwood

colors, for many of the modern slides are beautifully and truthfully colored.

Better than the lantern slide for the purpose is the motion picture, for with it as the agent the processes of manufacture and historic events unfold themselves before the audience. The motion picture is visual instruction at its best. "Some day our school children will be getting far more knowledge from moving pictures than from books and lectures," said Edison. The possibilities are great, but at present the cost of the apparatus and the difficulty of getting suitable films limit the use of the moving

picture. But a great deal is being done to provide films that are adapted to educational purposes. At present the films of the Bureau of Commercial Economics, of Washington, D. C., are available to schools and can be obtained through the Department of Extension. These are industrial pictures showing agriculture, mining, manufacture of fountain pens, watches, matches and many other things, and, although they bear the name of the company whose particular article is manufactured, they are highly educational in character.

The motion picture does not supplant the lantern slide. Each has its special value. Lantern slides can be held on the screen indefinitely for detailed study, which is possible with only a few specially made moving picture machines at the present. Motion picture reels are expensive and need an expert to make and direct their production. Lantern slides are comparatively cheap, and can be made by any amateur photographer, who does his printing and developing, from his own negatives. In this way the teacher can easily build up a lantern slide collection. Even if he is not a photographer, he can get his slides made from diagrams, pictures in books, magazines, or photographs by many of the leading slide companies, at prices ranging from 30 to 50 cents for plain slides and 75 cents to $1.00 for colored ones. Many of the photographers in Texas cities make slides.

Entertainment and Instruction by Lantern Slides.—The cheapness and the portability of the lantern and slides allow their extended use by county school superintendents, teachers, and farm demonstrators. By having slides made of good buildings, improved grounds, drinking fountains, terracing, good farming practice, and hundreds of other subjects, it is possible to drive home lessons in education and agriculture to audiences that can not be reached in any other way.

One of the problems of the school is to provide for the social life of the community. Meetings of a social nature, where the people can come together for entertainment and instruction, are great factors for bringing people together and, at the same time, uniting the school with the community. There is great need for this in the rural schools and the smaller towns. The teacher-

leader can do much to organize schoolhouse meetings, literary societies, mothers' clubs, civic clubs, group-study courses and like organizations, and then vitalize the meetings by giving illustrated lectures on such subjects as are of interest to the community. Better still, after thoroughly sudying a subject in school, the larger pupils can present the lecture, illustrated by the slides, to interested organizations.

Many of the churches of Texas are providing entertainment and instruction by the use of lantern slides in Sunday School and young people's organizations. Other organizations that are also making use of lanterns and slides are farmers' institutes, Y. M. C. A.s, libraries, art clubs, and group-study clubs.

The Use of Lantern Slides in Regular School Work.—Many of the larger schools and colleges are so well aware of the value of visual instruction that some of their class rooms are equipped with stereopticon lanterns and, in some cases, motion picture projectors. Class rooms are so arranged that shades can be drawn and the room darkened.

Some of the slide companies put up classified collections, carefully selected by men who are authorities on physical geography, geography, history, and other subjects. These slides are used like a library; a slide may be used in geography in one class, in travel, history, or some other subject in other classes. The Keystone "600" set is of this type.

But it is not necessary for a school to own slides. There are many sources from which slides may be obtained for the mere cost of transportation, among them being the Department of Extension of the University of Texas, which now has about fifty sets of slides most of them having been chosen with the idea of being used in school work as well as entertainment. See Appendix. By looking ahead and making requests in proper time, the resourceful teacher can obtain slides from the various sources to illustrate and vitalize the whole year's work.

How to Use the Loan Slides in Connection with School Subjects.—Suppose the teacher has sent for the University set on the Panama Canal. (See page 27.) With the slides there is a typewritten lecture describing them and giving the history of

the canal, a description of the country, and giving the story of its construction. The pupils can study this lecture beforehand so as to be thoroughly familiar with it. On Friday night, for instance, it can be presented at the schoolhouse meeting as a part of the program for the evening, either by the teacher or by the geography class, each pupil describing a certain number of slides to the audience. Songs, recitations, essays, and a debate bearing on the Canal may be a part of the program.

In the school work itself this material may be used in various correlated subjects:

(1) In geography it shows maps of the Canal, trade routes, scenery, homes and occupations of the natives and of the Americans; the engineering problems and the construction of the Canal; the effect of the torrid climate on laborers, "slides" that filled the canal, and sanitation.

(2) In history it furnishes material for the story of Balboa and other explorers, the "days of '49," the attempts of the French to build the canal, and the creation of the Republic of Panama.

(3) In physiology it shows the cause of malaria and yellow fever and how the Americans cleaned up the isthmus, giving suggestions for practical application in Texas.

(4) In civics, it leads to a discussion of the government of the Canal Zone, the treaties affecting the canal, the fortification, and the toll question.

(5) After the canal has been studied in one or more classes this material can be used in language work to supply subjects for essays, letters and compositions. The children can make note books of travel, geography, history, etc., and illustrate them with their own maps, drawings and pieures cut from magazines and newspapers. The best essays or letters may be used at the schoolhouse meeting program.

Following are some of the subjects that may be used.

(a) Imagine you are an engineer working on the canal. Write a letter to a friend telling (1) how you made the Culebra cut, (2) how you built Gatum Dam, (3) how you built the locks.

(b) Write a letter telling how a miner in 1849 reached Cali-

fornia by "going around the Horn." In answer, his friend tells how "he crossed the Isthmus." Write the friend's letter.

(c) Write the story of Ferdinand de Lesseps.

(d) Imagine you are a nurse in the canal zone. Write a friend telling how you helped to control the fevers.

(e) Imagine you are a tourist. Describe your trip from Panama to Colon, telling of the locks, Gatum Lake, Culebra cut, and other interesting things you would see in going through the Canal.

(f) Make a model out of wood or pastboard to show show the locks work. Write a description of your model.

(g) You are a New York merchant buying and selling along the west coast of South America. Describe the old routes, the new routes since the canal has been finished, the products you deal in, and the value of the canal to you. Are you afraid of competition from New Orleans and Galveston? Why?

Most of the facts necessary for the above letters and essays can be found in the geography, or the lecture. Additional material can be obtained from the Extension Loan Library of the Department of Extension. The resourceful teacher will find other topics of similar interest and other uses for the lecture. The above is merely suggestive.

The Stereopticon Lantern for Schools.—It is best for the school to own a lantern. A good lantern can be bought for $27 to $40, the price depending on the equipment and accessories. One North Texas school raised enough money at one entertainment to pay for its stereopticon. As a rule, the slides of the University are lent with the understanding that they are not to be used for the purpose of making money for an individual, but there is no objection to a small admission fee if the money is being raised to buy a lantern or other school equipment. The rural school without electricity is not barred but can use the Prestolite gas tank, such as is used on automobiles to furnish the necessary light. Even in daytime the shades may be drawn and the windows darkened sufficiently to show the pictures.

A school with its own lantern is independent and can make

arrangements for slides from the various institutions. If there are several schools near together that have lanterns, they can send for slides co-operatively and thus lower the express charges.

Buying Co-operatively—the "Slide Circuit."—Where one school can not afford a lantern, several can share the expense. Five schools can form a "circuit" and the cost of the lantern for each would be less than $10. If they send for loan slides, the express can be divided among the five and will be but a trifle for each. At the teachers' institute teachers can organize and form such a "circuit," arranging for the order in which they are to get the lantern, the payment of express charges, for gas tanks, and other details. They can make arrangements for slides early in the term, selecting the sets they will want and the date when wanted. These will be sent to the Department of Extension and filed. At the proper time the first set will be expressed to Mr. A. who, after using it, will send it to B; B to C, and so on until the circuit is completed. The slides are sent back to Austin and the machine to A, to begin all over again. When the schools are on a railroad the lantern and slides can be expressed from one school to another. In this case they are independent of transportation by wagons or automobiles, which is often difficult in seasons of bad weather.

The circuit plan is really the most economical method and gives the greatest possible service for the money spent. In Wisconsin the state is divided into a large number of circuits and slides and motion picture reels are routed over circuit I, then sent to circuit II, etc., until the whole state is covered.

The School which Has no Lantern.—The Department of Extension has four or five lanterns that it will lend for a short time. These must be packed carefully in trunks, making transportation charges rather high. For this reason schools are urged to buy their own lanterns.

If possible a circuit should be arranged so as to serve a number of communities before the lantern is shipped back to Austin. It is well to make the request a month or more before

it is needed so that a lantern may be reserved for the date requested.

Summary.—The Department of Extension urges schools to buy lanterns either individually or co-operatively, and, if possible, to arrange circuits to avail themselves of the illustrative material obtainable from the University and other sources. By the "circuit" method the greatest economy and efficiency is obtained.

Schools are urged to get some slides of their own, if possible. The Department can be of service in exchanging the slides of one school or county superintendent with those of another. This will be especially valuable if local geographical and historical material can be exchanged.

If possible, moving picture machines should be installed. These, however, require electricity. Inexpensive machines that are especially adapted to school use are now on the market. They can be operated from an ordinary electric light socket, an incandescent filament globe being used instead of an arc light; they do not require the usual fire proof booth; they are simple in their mechanism, and the film can be stopped at any point in order that special features of the picture may be stressed. The Department of Extension hopes to enlarge the fil mexchange feature as funds will allow. At the present time the films of the Bureau of Commercial Economics are being distributed by the Department. Write for a list of films in stock.

How Slides May Be Obtained from the University

Make your requests as soon as possible. These will be filed by the Department of Extension and the slides sent out on the day requested. Some teachers and preachers have made out their schedules for a whole year ahead. In the appendix is a sample application blank properly filled out. Use one of these blanks for convenience in filing and writing or give the information asked for in your letter (choice of slides, express office, whether a gas tank is to be sent, etc.). This is important because if a full equipment is to be sent it has to be shipped in a large trunk, each breakable part carefully

packed. If a gas tank can be obtained at a local garage (or if electricity is used) and if a curtain is provided by the school the lantern can be packed in a much smaller case (see Figure III). The lantern is practically assembled as found in the trunk, only the gas burner or electric globe and the slide carrier being packed separately. If the condenser lenses are loose in the cell, it may be necessary to pack these separately to prevent their edges from chipping. Slides and lectures are shipped in separate shipping cases (except when a trunk is sent). If slides are shipped by parcel post, no written or typewritten matter is allowed in the box, and lectures must be shipped in separate envelopes as first class matter.

Conditions Under Which Slides are Lent

1. The slides of the Department of Extension are lent free to the people of Texas. The use must be free to the people of the community, unless the money obtained is to be used to purchase a lantern or slides, or for some definite school purpose.

2. Transportation both ways is to be paid by the borrower.

3. Repair and breakage of slides and lantern while the equipment is in the borrower's possession is to be borne by the borrower.

4. Slides and lanterns are lent for a period of five days. All schedules are made up on this basis. If one person keeps the slides over time, someone else will be disappointed. Special arrangement can be made with the Department if an extension of time is desired.

5. Do not change the numbering on the slides. If you find it necessary to rearrange the slides for your lecture, kindly put them in proper order before returning.

6. Fill out the Report Blank. To save trouble, put the report blank, properly filled out, in the box when returning the slides. If the slides are shipped by parcel post, the report must be sent back in a separate envelope as first class matter.

CHAPTER II

Equipment for Visual Instruction by Lantern Slides—Manipulation of the Lantern

In order to show lantern slides at their best, the room should be made as dark as possible except where a powerful light is used in the lantern; then, faint illumination from outside will not affect the pictures. This is easy when pictures are shown at night, but for class room work or entertainment during the day it becomes a serious problem. In the average school curtains may be lowered and quilts, wagon covers, or dark cloth hung over the windows and the room can be dark-

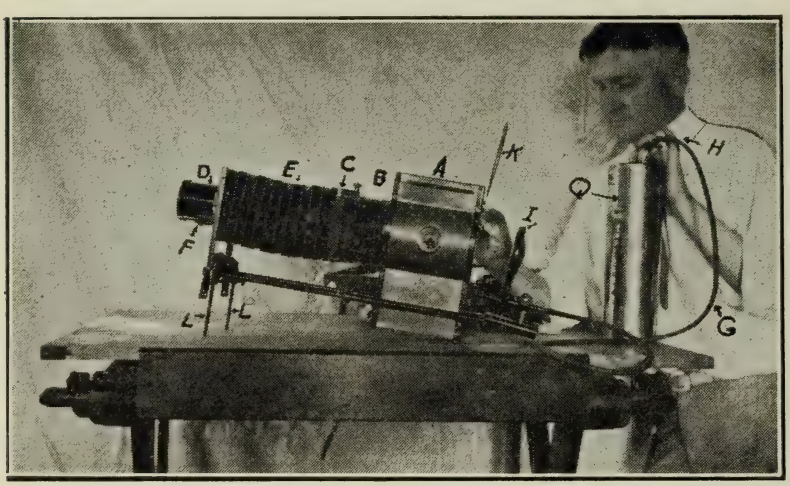


FIGURE II

Mr. Hoopingarner operating a lantern lighted with gas from a prestolite gas tank

ened fairly well. One county superintendent carried a number of pieces of black cloth with him to use for this purpose and found them very satisfactory.

Shades for the school room should overlap the window casings by three or four inches. They should be of a dark color and heavy material.

Screen.—A screen 6 by 6 feet is large enough for the ordinary school room. A fairly heavy cloth or bed sheet that is

not transparent and reflects a soft light will do. However, where a school purchases a lantern it is best to buy a screen of heavy material mounted on spring rollers like a window shade. It can then be rolled up out of the way and be protected from dust and from wrinkling (see frontispiece). Sometimes the white wall of the school room or the curtain of the stage can be used very effectively.

Metallic screens are very efficient reflectors, but unless the audience is seated almost directly in front of the screen it is difficult to see the pictures.

The Lantern.—While lanterns differ in appearance and details of structure and operation, they all consist of the same essential parts. If the function of these parts is understood

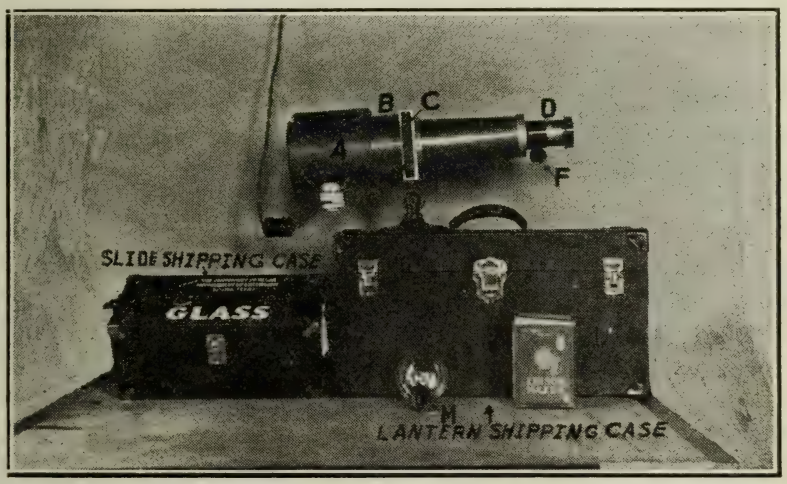


FIGURE III

Showing complete equipment. Lantern operated by electricity, with case and slides

there will be little trouble in setting up and operating a stereopticon.

The source of light, either gas or electricity is housed in the lamp house (a), Figures II and III. Next to the light is the condenser lens (b), the function of which is to gather the light and distribute it uniformly over the surface of the slide. This lens consists of two convex lenses mounted on a single cell, the curved surfaces facing each other.

Immediately in front of the condensor lens is the slide carrier which holds the slides (C).* A second set of lenses (D) (the projection lens) is placed at the front end of the lantern. This gathers the rays of light and projects them on the screen. The image is inverted in this process, making it necessary to place the slide upside down in the machine in order to have it appear correctly on the screen. (See also Figure V.)

In order to focus the lantern and adapt it to varying distances from the screen, the distance between the projection lens and the slide must be varied. Most machines allow this by having bellows (E), the finer adjustment being made at the projection lens. (Screw F.). The electric lantern shown in Figure III depends entirely upon the projection lens for focusing.

Manipulation of the Lantern

By referring to the diagrams the teacher ought to have little difficulty in setting up the stereopticon. One should take care to see that every piece is in its proper position. The lenses should be clean. They can be cleaned by moistening the surfaces with the breath and drying them with a piece of cheese cloth, linen, or other soft material. A coarse cloth should not be used as it will scratch the lens.

The lantern should be placed on a table directly in front of the screen about 18 to 25 feet away from the screen. This is the usual focusing distance for the lanterns sent out by the Department.

Lighting—Gas. The gas most commonly used is acetyline, sold in tanks for use on automobiles and motorcycles (Prestolite and Searchlight). These tanks can be rented from garages and returned after the gas has been used. The motorcycle size [shown in Figure II (Q)] will last for about three or four lectures of an hour and a half to two hours in length. Where the

*In some lanterns the slide carrier has been replaced by other devices. In one of them the slides are slipped into a slot from above. The second slide forces out the first one. In another machine the slides are raised into place by means of a handle from below.

lantern is to be used for a week or more it is better to get the larged sized tank.

The rubber tube (G) is attached to the tank and the flow regulated by means of the key (H). One should be sure to have a tight joint at the tank and where the tube is attached to the burner so that no gas can escape.

The burner (I) consists of a lava tip backed by a mirror. (This varies with different lanterns). To light the burner, open the valve slowly, light, add more gas until the light is the proper height. If there is a hissing sound, there is too much gas. Push the burner into the lamp house and pull down the door (k). Place the tank under the table so as to get it out of the way yet within reach so that the light can be easily regulated during the lecture.

Electricity. For school use and especially for portable lanterns the large 400 watt Mazda globes are now used in place of the arc light. (M, Figure III).) These can be attached to the ordinary light socket and do not require any special wiring or rheostats. Usually the back part is silvered, thus serving as a mirror. The globes are very sensitive and must be packed carefully in cartons with protective material around them. They should never be left in the lantern during shipment. In most lanterns these globes are lowered into the lamphouse from above and screwed into the socket.

In many communities it is becoming more and more difficult to obtain the Prestolite tanks because the automobiles are being electrically lighted to a greater extent. A small portable storage battery has been perfected which can be used in place of gas tanks and so make electricity available for rural schools.*

*One manufacturer announces: "We are now prepared to supply a six-volt incandescent bulb for use in both the Model B and C Balopticons, suitably mounted for convenient interchange with other light sources. The six-volt size gives very satisfactory illumination and the image which can be obtained is about six or seven feet in width. There is practically no heat with this light source, and a much sharper and clearer picture is possible with this light source, because it much more nearly approximates a point than does acetylene. The six-volt incandescent lamp is operated from a storage battery and the battery can be recharged at a garage or electric light

To Adjust.—After the lights are on, darken the room and see that the light falls upon the screen properly. The table ought to be fairly high so that the stream of light will "shoot" over the heads of the audience. By raising the front of the lantern, additional height may be obtained. In the electric lantern [Figure *III*] this can be done by merely pulling up the

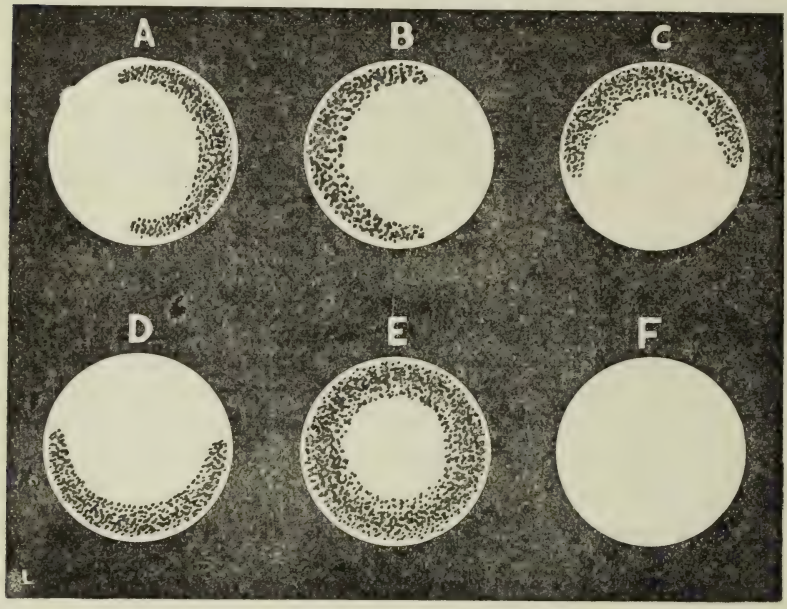


FIGURE IV

The proper light effect on the screen

front; in the other, by loosening the set screws and adjusting the legs [*L*] or by putting books or blocks under it.

To Focus. Put a slide into the carrier. Practically all slides

charging station. A six-volt eighty-ampere hour battery will furnish energy for ten or twelve hours' consecutive burning. Where twelve volts are used, it might be possible to split the battery in half and obtain six volts, which would give just the right pressure.

"The lighting system of a Ford car can be employed. We believe that some of the Ford cars are equipped with six and others with twelve-volt outfits, and in the case of the twelve-volt equipment, if you can insert enough resistance the lighting system could be used."

have a star, "sticker" or some distinguishing mark in one corner. Grasp the slide with the *right hand, and, with the thumb on this mark* put it into the holder and the slide will appear correctly on the screen.

See if the picture is sharp on the screen. Push in the bellows or pull it out until the picture is fairly well in focus, then use the projection lens screw (*F*) to bring out the fine details. Lantern (*III*) is focussed by the latter method entirely.

If the picture is too small, move the table with the lantern further back into the room and refocus. The nearer the machine is to the screen the longer the bellows will need to be.

To Clear of Shadows. Take out the slide and see if the light is clear, bright, and evenly distributed over the screen. Perhaps there is a bluish shadow on the screen. (Figure IV) This shows that the light is not directly behind the center of the condensing lens. There are two set screws on the gas burner. Loosen these, and (Fig. II) the flame can be raised, lowered, or twisted to the right or left.

If the shadow is on the left (A), it shows that the light is too far to the right. If the shadow is like (C) the light must be lowered, (D) raised, (B) moved to the right. If the shadow is like (E), the light is too near or too far away from the condensor lens. Move the burner backward or forward until the screen is clear. In some lanterns this is the only adjustment needed. Tighten all screws, then light the gas from the top to avoid disturbing the adjustments.

Make any final adjustments and the equipment is ready for use.

Opaque Projection. Can post cards, pictures from books, maps be thrown on the screen by the stereopticon? This question is often asked. It can not be done by trying to throw the *light through* the object as in the case of lantern slides, but is done by *reflection.* This is shown in Figure V where the two kinds of projection are compared. The light is reflected from the post card or picture D through the lens E and by the mirror F on to the screen. Considerable light is lost at D and F, and by the change in the direction of the light. Larger lenses, more intense light, and a shorter distance from the

screen are necessary to overcome this. As one manufacturer says, "To accomplish really satisfactory results it is necessary to have a totally darkened room and a good quality of screen, one with a white opaque or aluminum coating." Except for

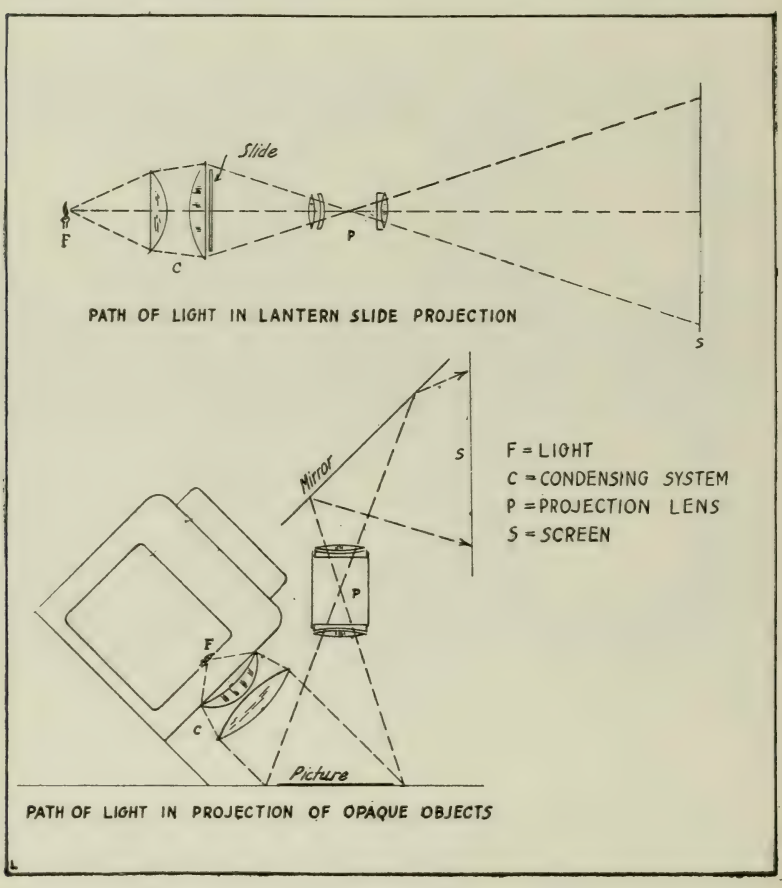


FIGURE V

Path taken by rays of light in direct and opaque projection

short projection distances, "the only illuminants we recommend for the projection of opaque objects are the arc lamp, using from 25 to 35 amperes of current, and the 1000-watt gas filled stereopticon Mazda lamp."

Suggestions for Lantern Purchasers

Write to the various companies for their catalogues. After selecting the type preferred, write to the manufacturers, stating your conditions: the size of the room, whether you wish to use gas or electricity, the current available, distance to the screen, and whether you want it for permanent use in the school or as a portable outfit to be carried about. The company will give you advice as to the best type of lantern for your use.

Get a lantern that is as simple as possible. Test the lens by putting a slide in the machine showing a map or one that has considerable reading matter on it. See if all the reading matter is in good focus to the extreme margin. If it is not, reject the lens.

If any further information is desired, write the Department of Extension, University of Texas, Austin, Texas.

APPENDIX.

Other sources where slides may be borrowed:
A. and M. College of Texas, College Station, Texas.
U. S. Department of Education, Washington, D. C.
U. S. Department of Agriculture, Washington, D. C.
U. S. Department of Interior, Washington, D. C.
Russell Sage Foundation, New York, N. Y.

Slides may be purchased from the following places:
McIntosh Stereopticon Co., Chicago, Ill.
Keystone View Co., Meadville, Pa.
Education Exhibition Co., Providence, R. I.
Badger Stereopticon Co., La Crosse, Wis.
Pierre M. Foltz, 302 N. E. Washington, D. C.
Central Scientific Co., Chicago, Ill.
Williams, Brown, and Earle, Inc., Philadelphia, Pa.
Underwood and Underwood, New York, N. Y.
Victor Animatograph Co., Davenport, Ia.
T. H. McAllister Co., 49 Nassau St., New York City.
Chas. Beseler Co., New York City.

Stereopticon Companies:
Bausch and Lomb Optical Company, Rochester, N. Y.
Victor Animatograph Co., Davenport, Iowa.
McIntosh Stereopticon Co., Chicago, Ill.
Spencer Lens Co., Buffalo, N. Y.
Badger Stereopticon Co., La Cross, Wis.

Companies Where Moving Picture Machines May Be Purchased:
"Motiograph" Enterprise Optical Mfg. Co., Chicago, Ill.
Thomas A. Edison, Inc., West Orange, N. J.
"Edingraph" Kleine Optical Co., Chicago, Ill.
Badger Stereopticon Co., La Crosse, Wis.
Simplex Precision Machine Co., New York, N. Y.
Standard Motion Picture Co., New York, N. Y.
Portescope, Motion Picture Scope Co., Chicago, Ill.
De Vry Corporation, Chicago, Ill.
Southern Theatre Equipment Co., Dallas, Texas.

LIST OF LOAN SETS OF UNIVERSITY OF TEXAS, DEPARTMENT OF EXTENSION

School and School Activities

1. *The University of Texas* (97 colored slides with lecture by N. L. Hoopingarner).

The purpose of this lecture is to give the people of the State an idea of the life and work of the University. Among the pictures shown are the Faculty, the buildings, scenes on the campus and abou Austin, the churches and religious influences about the campus, famous alumni, and the students at their work and sports.

2. *Rural School Improvement in Texas.* (Two sets with lectures by E. E. Davis, Department of Extension, University of Texas.)

Both lectures deal with good and bad conditions found in Texas schools, houses, seating, lighting, etc. The progress in Texas in school gardens, industrial work, consolidation, transportation, recreation, and the teacher as community leader are outlined.

3. *Construction and Hygiene of School Buildings.* (40 plain slides with lecture by A. Caswell Ellis and N. L. Hoopingarner, University of Texas.)

This lecture shows the artificial conditions under which the modern child is being educated and shows how proper housing, lighting, heating and ventilation overcome these, and secure the maximum of efficiency.

4. *The Improvement of School Grounds.* (32 slides, part colored, with lecture by Mr. and Mrs. A. Caswell Ellis, University of Texas.)

The principles of landscape gardening as applied to school ground decoration and how to apply them. Most of the pictures are taken on the University grounds and show what can be done by the simple, yet effective use of native shrub and trees in school ground decoration.

5. *The School House as a Social Center.* (44 plain slides with lecture by Clarence Arthur Perry of the Russell Sage Foundation, New York.)

Mr. Perry shows the need for recreation and what some of our larger cities have done in providing for indoor sports, folk dancing, study, manual training and sewing in the school buildings outside of school hours. These schools are also used for parents teachers meetings, social gatherings, lectures, and work room for grown ups.

6. *Socializing Activities of the School.* (52 plain slides with lecture by Mrs. K. M. Cook, and Miss Belva Guzzort, of the United States Bureau of Education.)

This set of slides shows the various socializing activities now being carried on in rural schools in the United States. It takes up the home project in agriculture; the project work in school, such as manual training, cooking, sewing, and agriculture, correlated with the school curriculum; games, athletics, playground apparatus, music and other recreation that will help to socialize the school.

7. *Consolidation of Rural Schools.* (52 slides with an outline lecture by A. C. Monahan, U. S. Bureau of Education.)

With this set of slides is an outline and not a complete lecture. References are given to various bulletins on consolidation and it is in itself a full discussion of the subject of consolidation rather than a mere description of the slides.

8. *Rural School Buildings and Grounds.* (52 plain slides with lecture by U. S. Bureau of Education.)

These slides show school buildings and equipment in rural communities in various parts of the United States. The lecture is an outline of how this set may be used to suit local conditions. Good and poor building, heating, playgrounds, and apparatus, drinking fountains, transportation, and teacherages are illustrated by the slides.

9. *Recreation: Plays and Games.* (62 slides with lectures.)

Playgrounds of city children in the congested districts, are contrasted with playgrounds and parks. Apparatus, baseball,

basketball, races, folk dancing, May-pole dance and games, bathing, and the sand pile, as elements in producing healthy children, are discussed.

10. *The New Era in Country Life and Country Schools.* (75 colored slides with lecture by W. H. Dudley, Extension Division, of the University of Wisconsin.)

The outline accompanying the lecture is only suggestive, and the slides can be rearranged to adapt the lecture to the needs of the audience. The conditions of the older days in country life and schools are contrasted with those of modern days.

ART.

11. *Great Paintings.* (45 colored slides with lecture by Miss Stella Elmendorf, San Antonio, Texas.)

This lecture begins with Fra Angelico, in the 14th Century, and shows masterpieces of painting from that time to the present. It shows the development of painting from the religious subjects of the early painters to the landscapes and portraits of our American painters.

12. *Masterpieces of Painting.* (49 colored slides with lecture by Mrs. John B. Sherwood, Chicago, Ill.)

This set consists of a different selection of slides from "Great Paintings" but also begins with the Italian masters and shows the evolution of art through the Spanish, Dutch, English, French, and American artists.

13. *The Child in Art.* (50 colored slides with a lecture by Mrs. John B. Sherwood, Chicago, Ill.)

This lecture "brings to you the best paintings of the greatest masters who have painted children." Among the painters so selected are Titian, Raphael, Van Dyck, Velasquez, Reynolds, Watts, Millett and several Americans.

14. *Architecture.* (50 colored slides with a lecture by Samuel E. Gideon, Professor of Architecture, University of Texas.)

This lecture traces the evolution of great architecture from

Egypt through Greece, Rome, Byzantium, Italy, the Gothic of Germany, France and England, to the modern buildings of our own capitol at Washington and the Boston Public Library.

15. *Sculpture.* (50 slides with a lecture by Samuel E. Gideon, University of Texas.)

This set of slides deals with the history of sculpture, and illustrates the subject by twenty-six slides on Greek sculpture, ten on the work of the Italian, four on French and Danish, and ten on the work of American sculptors.

16. *Panama Pacific Exposition.* (70 colored slides with lecture by C. M. Jansky, University of Wisconsin.)

This lecture takes up the plan of the exposition, the architecture, the color scheme, the landscape gardening, illumination, mural paintings and sculpture, discussing each subject as a unit and illustrating the points brought out by beautifully colored slides.

Geography and Travel

17. *Scenic Wonders of Our West.* (100 colored slides with lecture by John DeSay.)

This set consists of twenty-three slides on Yellowstone Park, six on Washington (State), thirty-three on California, including Yosemite, twenty-four on Arizona, mostly on the Grand Canyon, and fourteen on Colorado.

18. *A Tour of the United States.* (50 colored slides with lecture.)

The audience is carried on a trip starting at New York to Washington, through the South Atlantic States to Florida. From here the trip is continued to the west via St. Louis, through the Pacific States, and home over Yellowstone Park, Chicago, Philadelphia, with the "wind-up" in New England.

19. *Around the World in Eighty Minutes.* (80 colored slides with lecture.)

This trip starts at New York. England is first visited and the journey carries the audience across Europe to Italy, Palestine, Egypt, India, China, Japan, and then overland to New

York from San Francisco. Many beautiful cities and historic scenes are shown.

20. *The Panama Canal.* (Set A: 52 slides, part colored, with lecture. Set B: 48 slides, part colored, with lecture.)

Both sets treat of the geography and history of Panama, work of the French, the problem of sanitation, work of excavation at Culebra, construction of the locks and Gatum dam, and the final completion of the canal and its benefit to the United States.

21. *Palestine and Syria.* (72 slides with lecture.)

The audience is taken on a tour through the Holy Land, landing at Jaffa on the Mediterranean, going overland to Jerusalem; from here the journey is continued to Bethany, up the Jordan Valley, to Bethlehem and other places connected with Biblical history, to Damascus, through Syria and back to Beyrut.

22. *Niagra Falls.* (60 slides with outline lecture.)

The teacher can use the outline to make several lectures from this set. Some of the slides show the physiographic and geological aspects of the Falls, about fifteen slides treat of power development, a few show points of historical interest, while all of them with the exception of a few maps, will be of interest from the tourist's point of view. Geography teachers will find the set of great use in the class room.

23. *Meterology and Climatology.* (100 slides with outline lecture.)

"This collection of slides used in the class room or on the lecture platform will do much to make the weather understood, not guessed at, by the everyday citizen." The accompanying lecture is an outline describing each slide and allows considerable rearrangement to suit the lecturer. About fifteen slides are devoted to temperature, twenty-five to winds and storms, including the Galveston storm, ten to precipitation, twenty to clouds and lightning, fifteen to the work of the Weather Bureau, and a few on other climatological data, including the Dayton flood of 1913. Teachers of Geography and Physical Geography will find these slides very valuable.

24. *The Grand Canyon of the Colorado.* (38 colored slides with lecture by M. E. Hendy.)

The lecture takes up the history of the discovery of the Canyon, the geography, and a description of the "magnificent majesty, gorgeous coloring, and multiplicity of sculptured forms" of this great wonder of nature.

Science, Nature and Health

25. *Bird Life.* (Set A: 50 colored slides with lecture by W. S. Taylor. Set B: 50 colored slides with lecture by Prof. Taylor.)

Both sets are a pleasing personal description of fifty birds, their life, habits and their value to Texas. They are a strong plea for bird conservation. Set B does not describe the same birds as set A.

26. *Forms and Colors of Flowers in their Relation to Insect Visits.* (65 colored slides with lecture by W. H. Dudley, Division of Extension, University of Wisconsin.)

This lecture treats in a popular and poetical way of the various means employed by flowers to attract insects and so secure proper pollination.

27. *Burbank's Plant Creation.* (Set A: 86 colored slides with outline lecture. Set B: 40 colored slides with lecture.)

A brief biography is followed by pictures of flowers and plants used by Mr. Burbank to produce his famous crosses and the resulting hybrids.

28. *Insects and Disease.* (36 plain slides with lecture.)

This lecture takes up the way in which insects produce and carry diseases. Sleeping sickness, bubonic plague, Rocky Mountain fever, Texas fever, malaria, yellow fever and typhoid are among the diseases discussed.

29. *The Cigarette.* (25 slides with lecture.)

These slides are largely diagrams showing the waste and ef-

fect of cigarette smoking. The lecture is a lengthy discussion and covers the subject thoroughly.

30. *Malaria.* (No lecture.)

31. *Typhoid Fever.* (No lecture.)

32. *Preparation of Food in Various Countries.* (No lecture.)

History

33. *George Washington.* (60 colored slides with lecture by L. D. Peaslee, Curator of Education, Public Museum, Milwaukee, Wis.)

First of all, the life in the colonies of Washington's time is discussed; his boyhood, his part in the French and Indian and Revolutionary war and his presidential career. Many scenes of the Revolutionary War, pictures of Washington as a farmer and his home life are included. With its explanatory maps, this lecture is a good summary of the history of the United States from 1764 to 1800.

Agriculture

34. *Cooperation in the United States.* (22 plain slides with a lecture by G. S. Wehrwein, University of Texas.)

This lecture describes cooperation in meat and ice clubs, marketing of eggs, dairying, creameries, laundry, truck, and cotton marketing. It cites many concrete cases of successful farmers' organizations in the United States and in Texas.

(Note.—The following sets are placed with the Department of Extension by the International Harvester Company. Many of the sets are colored; all have printed lectures to explain the slides. The Department also acts as the Texas distributing agent for all the agriculture charts and slides issued by the International Harvester Company, which include many subjects not listed below.)

No. 1. *Corn is King.*—A most interesting and instructive lecture dealing with the corn crop—Essential points in corn

improvement—Selecting and testing seed—How to increase profits in growing—Designed for the use of lecturers in the corn growing states.

No. 2. *Alfalfa on Every Farm.*—Treats fully of the agricultural value of alfalfa as a soil enriching crop—As a feed for live stock in comparison with other feeds—Its influence toward a diversified system of farming—Effect on land values—Preparation of seed bed—Rate of seeding—Essential points in growing—Soil inoculation—Harvesting and care of crop, etc.

No. 3. *A Fertile Soil Means a Prosperous People.*—An object lesson in the great fundamental of agriculture—The Soil—What it is—Showing the results of over fifty years of experimental work in the growing of crops and their effect upon the fertility of the soil—A one-crop system—What it means—Crop rotation, its objects and results. These charts prepared from authentic sources of information obtained from results of investigations under many conditions of soil and climate. Deals with the problem of living.

No. 4. *Live Stock Farming Means Permanent Agriculture.*—A vital problem in American farm practice—The growing of live stock, its advantages over grain farming—Maintains soil fertility—Points to diversification of crops—Conserves waste—Means greater profits—A simple yet comprehensive treatment of the importance of live stock farming—The feeding of live stock—Compiled from actual experiments with crops and animals under ordinary conditions.

No. 5. *Dairying.*—Importance of the Dairy and its products—Points in a dairy cow—The Babcock test—How to improve the dairy herd—Profits, etc. A very interesting lecture on a vital subject which concerns every farming community.

No. 6. *Greater Profit from the Oat Crop.*—The oat crop—Acreage and distribution in the United States—How to improve—Early, medium and late variety tests—Fanning, grading, methods of soil preparation, harvesting and care of the crop—Treatment for smut diseases, and a number of other interesting facts which point to greater profits from the oat crop.

No. 7. *Make More from Farm Poultry.*—Importance of the poultry crop—Breeding, feeding and housing—Handling and marketing products—How farmers can make poultry pay.

No. 8. *Weeds Mean Waste.*—The place of the weed as an influence in reducing farm profits—Cost United States $300,000,000 annually—Robs the soil—Reduces yield and profit—Means wasted land and labor without return—Varieties of weeds and their distribution—How to eradicate—A lesson which carries a message to the home of every American farmer.

No. 9. *Home Economics.*—How to live, be healthy and more efficient. Nothing concerns the standards of life more than the science of the home. A lecture of great interest.

No. 10. *Dangers of the House Fly.*—How the common house fly spreads filth and disease—Carries typhoid and germs of other contagious diseases—Causes thousands of deaths in the United States, annually—Its life, habits and breeding places—Methods of extermination, etc. A striking lesson which should be borne to every household.

No. 11. *Why Teach Agriculture in the Schools?* or *"The Great Forward Movement in Education."*—This lecture is of vital interest to everyone because it deals with the things which concern all the people—Can such a subject be without educational value?

Agriculture is active and constructive, scientific and industrial. It employs the hand as well as the head. It combines thought with action, awakens interest, give purpose, teaches thrift and self-reliance; and these are the principles which underlie character, and success in life.

If rightly taught, it will develop in early life the ability to do a definite thing. It will motivize and strengthen our life's work.

No. 12. *Home Canning by the Cold Pack Method.*—It is estimated that one-half of the fruits and vegetables grown in the United States are wasted. Half of the people are hungry. Why not can these products of the soil? The most approved method of doing it is by the "Cold Pack Method." It is a safe method. It saves work and time—takes the drudgery out of canning.

SAMPLE APPLICATION BLANK

(Reverse side of card.)

CONDITIONS UNDER WHICH SLIDES ARE LENT

1. The slides of the Department of Extension are lent free to the people of Texas. The use must be free to the people of the community, unless the money is to be used to purchase a lantern or slides, or for some definite school purpose.

2. Transportation both ways is to be paid by the borrower.

3. Repair and breakage of slides and lanterns, while the equipment is in the borrower's possession, is to be borne by the borrower.

4. Slides and lanterns are lent for a period of five days. All schedules are made up on this basis. If one person keeps the slides over time, someone else will be disappointed. Special arrangements can be made with the Department for an extension of time when desired .

5. Do not change the numbering on the slides. If you find it necessary to rearrange the slides for your lecture, kindly put them in proper order before returning.

6. Fill out the Report Blank. To save trouble, put the report blank, properly filled out, in the box when returning the slides. If the slides are shipped by parcel post, the report card must be sent back in a separate envelope as first class matter.

(Application side of card.)

APPLICATION BLANK FOR LANTERN SLIDES

From University of Texas, Department of Extension.

Slides wanted: Date wanted: *Sept. 23, 1917.*
Panama Canal A
School House as Social Center
(First Choice)
Dairying
(Second choice)
Shall we ship by Express or Parcel Post? *Express.*
Shipping address, *Llano, Texas.*
Is Department to send a lantern? *Yes.*
Is gas or electricity to be used? *Gas.*
Is Department to send curtain? *No.* Gas tank? *No.*
Remarks: *We are trying to raise money to buy a lantern.*
Signature, *Richard Roe.*
Institution, *School.* Address *Lone Grove, Texas.*

(Sample Report Card)

Face Side

READ CAREFULLY BEFORE USING.—One of the conditions of this loan is that you will observe the following rules. Note especially rules 4 and 6.

CONDITIONS UNDER WHICH SLIDES ARE LENT

1. The slides of the Department of Extension are lent free to the people of Texas. The use must be free to the people of the community, unless the money is to be used to purchase a lantern or slides, or for some definite school purpose.

2. Transportation both ways is to be paid by the borrower.

3. Repair and breakage of slides and lanterns while the equipment is in the borrower's possession is to be borne by the borrower.

4. Slides and lanterns are loaned for a period of *five days*. All schedules are made up on this basis. If one person keeps the slides over time, someone else will be disappointed. Special arrangements can be made with the Department for an extension of time when desired.

5. Do not change the numbering on the slides. If you find it necessary to rearrange the slides for your lecture, kindly put them in proper order before returning.

6. Fill out the Report Blank on the reverse side of this card. To save trouble, put the report blank, properly filled out, in the box when returning the slides. If the slides are shipped by parcel post, the report card must be sent back in a separate envelope as first class matter.

(The Report Side of Card)

UNIVERSITY OF TEXAS, DEPARTMENT OF EXTENSION
Visual Instruction

Date, *9/23/17*. Town, *Lone Grove*.
Attendance at each exhibition *(1) 75 (2) 100 (3) 50*
Names of sets used: *Panama Canal and Dairying.*
Places where used: *Lone Grove, 2 meetings; Llano, 1 meeting.*
Was admission charged? *Yes.* Amount received. *$45.* For what purpose was the money used? *To purchase lantern for Lone Grove School.*
Remarks *Two slides were accidentally broken. Please notify me as to cost.*

. . . . . .

Signature: *Richard Roe, principal.*
Institution: *Lone Grove School.*

DEPARTMENT OF EXTENSION

Edwin DuBois Shurter, Director of the Department.
Houston Smith, Secretary of the Department.

Division of Extension Teaching:

Raymond G. Bressler, Head of the Division.
Wm. K. Hall, Registrar of the Division.

Division of Information:

J. W. Shepherd, Head of the Division.
Dan McCaskill, Assistant in Exhibits.
Erle M. Racey, Assistant in Lantern Slide Service.
Lenoir Dimmitt, Extension Loan Librarian.
Jean D. Campbell, Assistant Loan Librarian.
Louise W. Morris, Reader to Loan Librarian.

Division of Home Welfare:

Mary E. Gearing, Head of the Division.
Minerva Lawrence, Lecturer on Home Economics.
Caroline E. Cook, Lecturer on Home Economics.

Division of School Interests:

W. S. Taylor, Head of the Division.
E. E. Davis, Lecturer on Rural Education.
Amanda Stoltzfus, Lecturer on Rural Education.
Roy Bedichek, Assistant Director of the Interscholastic League.
Willie Thompson, Secretary of the Interscholastic League.

Division of Public Lectures and Publicity:

W. D. Hornaday, Head of the Division.
Mrs. Elsie Holcombe, Secretary of the Division.
Mrs. Charles Stephenson, Student Cataloguer.

B116-717-3m

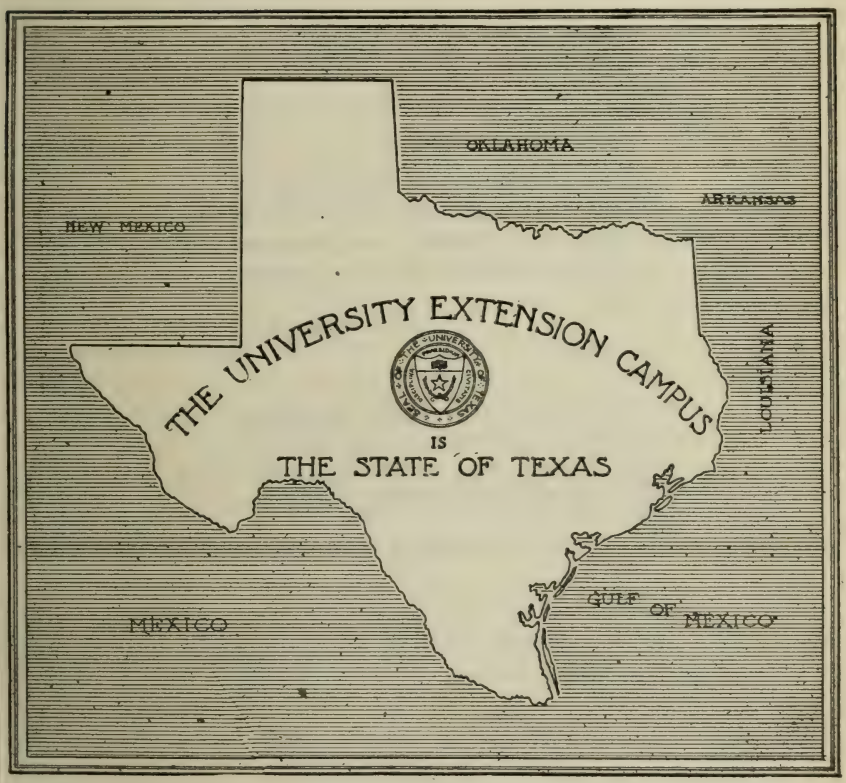
University of Texas Bulletin

No. 1731: June 1, 1917

Yeast Bread and Its Variations

BY

JENNIE R. BEAR
Instructor in Home Economics



Published by the University six times a month and entered as second-class matter at the postoffice at
AUSTIN, TEXAS

The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston

Cultivated mind is the guardian genius of democracy. . . . It is the only dictator that freemen acknowledge and the only security that freemen desire.

Mirabeau B. Lamar

YEAST BREAD AND ITS VARIATIONS.

There is no article of diet more universally used and more capable of variations than bread, and no matter whether it be the corn pone of America, the black bread of the German peasant or the oatmeal scone of the Scotch laborer, it is a valuable source of nutriment.

Methods of Grinding Grain and Making Bread.

Almost all primitive people, including the American Indian, ground their grain into meal between two stones. Indeed it is still a common practice in semi-civilized countries. We have only to cross the border to the south of us to find the Mexican woman patiently grinding her corn in this fashion for her daily supply of *tortillas*, the bread of the Mexican laboring class. More than six hundred years before the coming of Christ the Egyptians cultivated wheat. At first the wheat grain was ground into flour meal by the teeth, then the pestle and mortar were used. The Greeks learned from the Egyptians the use of wheat and when they were made captives by the Romans they were made grinders of wheat. Through the practical Romans the pestle and mortar were fastened together into what they termed the querm, this gradually became the grist mill, which was run by slaves.

The evolution of the milling of grain, from the primitive methods of grinding to the highly complex steel roller mills, is one of the most interesting chapters in our industrial history.

Methods of Bread Making.

It is frequently said that a people's civilization may be measured in terms of their bread making. In the earliest history of mankind both leavened and unleavened bread were used, the unleavened being the simplest product and consisting of flour or meal and water mixed together and baked.

Examples of unleavened bread are found in the Passover

cake of the Israelites, in the hard tack and sea biscuit used by the Navy and the Army of today and the Scotch oat cake and the corn pone in the South. No doubt the first leavened bread was merely a "happen so," the mixture of flour and water having set long enough for the yeasts falling in from the air to aid in a spontaneous fermentation. As the milling process was too difficult and the grain too scarce to waste, this mixture was baked and Lo! a bread of better taste and texture was the result. It was only a step from this method to saving a piece of dough to induce fermentation in a new batch. As it was not possible to keep dough for weeks or even months the method of drying yeast was finally evolved. Since the process of making bread from the dry yeast cake was a long one, beer yeast or soft yeast in time became the most popular. The Greeks and Romans made good bread and maintained regular bake shops, where it could be purchased. As early as 170 B. C. baking was a regular trade in Rome.

The Bodies Need of Food

To keep her family in good health through the use of proper foods it is necessary that a woman should know that the body is made up of water and certain substances called carbohydrates, fats, proteins and mineral salts, and that it is constantly being built up and torn down. Whether we are awake or asleep the body goes on working. The heart must keep up its steady beating and other vital processes must go on so that it is necessary that these materials, essential to its growth and repair, be taken into the body in the form of food. Protein is a muscle building substance, carbohydrates and fats give the energy to build and to work while mineral salts regulate the vital processes of the body as well as enter into its composition.

It would be impossible to live on one or even two of these substances alone, but it is necessary that each of them should be found in our daily meals and in relatively the right proportion, if the body is to be made healthful.

The Balanced Ration.

Nutrition experts have worked out the proper diet for the average man. They say he should have about four ounces per day of protein, four of fat, and about eighteen of digestible carbohydrates so chosen that the mineral salts requirement is included and enough bulk is given to satisfy and to provide work for the intestines.

As soon as we begin to think of balanced rations we must begin to think of food composition; e. g. when we say four ounces of protein we do not mean four ounces of meat. Although meat is very high in protein it has a certain amount of fat, a certain amount of connective tissue, a certain amount of water. In order to feed four ounces of protein we must know what per cent of each food served is protein. Thus we might get ½ ounce of protein from bread, ½ ounce from vegetables, 1 ounce from eggs and one ounce from milk and use no meant at all.

In Farmers' Bulletin No. 128, United States Department of Agriculture, we find the composition of nearly all our common food stuffs and can easily estimate the amount of protein we are feeding or should feed.

Wheat Flour a Valuable Food

The wheat grain contains all of the food constituents. The amount recovered in the flour will be determined by the milling process; e. g., in Graham flour, which is usually a mixture made by the miller but which should be a wheat meal containing all of the grain, 100 lbs. of wheat will yield 100 lbs. of flour. In whole or entire wheat flour, which as a matter of fact has some bran although the manufacturers claim it contains all of the nutritious part of the wheat grain minus the bran, 100 lbs. of wheat yields 85 lbs. of flour.

The white patent flour has the bran, aleurone layers, and the germ removed thus removing much nitrogenous matter, mineral salts, and fat, and only 72 pounds of flour is recovered from 100 pounds of wheat.

In these different flours there is perhaps as great a difference in the digestion of the different nutriments.

Breads made from these three flours were submitted to digestive experiments and it was found that while with white bread 85 per cent of the protein, 56.4 per cent fat, 97.5 carbohydrates were digested; with entire wheat 80.4 per cent protein, 55.8 per cent of the fat, 94.1 per cent of the carbohydrates; and with Graham bread 77.6 per cent protein, 58 per cent fat, and 88.4 per cent carbohydrates. As a source of protein and energy the coarser and finer flours are nearly equal in digestive nutriments. Experiments have shown that the amount of protein digested and absorbed from a pound of Graham or "entire wheat" or from a pound of patent flour is practically the same, but Sherman points out that bran yields from 10 to 20 times as much of the ash, which is essential to the body, as does patent flour and that three-fourths of the ash constiuents of the wheat kernel is lost to man in the process of manufacturing the wheat into white flour. Doubtless there is a greater loss in digestion for the Graham and "entire wheat" than for the patent flour. It has been shown, however, that from a pound of genuine whole wheat bread at least twice as much phosporus, iron and calcium compounds are absorbed as from a pound of white bread.

AMOUNTS OF ENERGY AND PROTEIN OBTAINED FOR 10 CENTS EXPENDED FOR BREAD AND OTHER FOODS.

(Figures from Farmers' Bulletin No. 487, United States Department of Agriculture.)

Food Material	Price per pound	10c will buy ounces	10c worth will contain	
			Protein ounces	Fuel Value Calories
Wheat bread	5c	32	2.9	2400
Cheese	22c	7.3	1.9	886
Beef average	20c	8.0	1.2	467
Dried beef	25c	6.4	.1	315
Eggs	25c	1.0	1.3	198
Milk, per quart	9c	38.3	1.2	736
Potatoes, per bushel..	60c	106.7	...	2950

From this table we may see that with normal prices we may expect to get more protein and more energy value from 10 cents spent in bread than 10 cents spent in beef steak or cheese. In the amount of bread we would care to eat we would scarcely find enough protein. If we, at the same time, drink unskimmed milk we add protein and also add mineral salts which were removed from the wheat in the milling process. In this way we may secure a well balanced and easily digested ration.

Essentials for Good Bread.

To make good bread it is necessary to have good flour, good yeast, a good oven and ability to control the temperature to some degree during the rising process.

Sugar, salt, fat and various liquids are used chiefly for flavor.

Flours.

There are two kinds of wheat, winter and spring, or soft and hard. There is a harder variety of winter wheat, but it is not so hard as the spring wheat.

The winter wheat, which is the wheat sown in the fall of the year and developing through the winter and summer, has a much higher starch content than does that sowed in the spring and harvested in the autumn. On the other hand, the spring wheat which has so much shorter time to grow has a higher protein content. Flour contains two proteins, glutenin and gliadin. When subjected to pressure and moisture these proteins combine to form a sticky substance called gluten. It is on the elasticity of this gluten that we depend for the expansion of our bread. To make the most elastic gluten these two proteins must bear the relation of two of gliadin to one of glutenin.

After moisture is added manipulation aids in developing this gluten. Without manipulation the amount of gluten developed is negligible. This accounts for the fact that cake batters made from bread flour which are beaten a great deal, are bready and that very poor flours may make good bread if manipulated until all the potential gluten is developed. The wrink-

ling of a loaf made from soft flour is likewise accounted for by the lack of sufficient gluten to form a perfect framework for the loaf. The better the grade of this gluten the less flour is needed to make a stiff dough from one cup of liquid. The best grade of spring flour will require only three cups of flour to the cup of liquid, while as many as 5½ may be required for winter wheat flour.

Gluten is the substance which distinguishes the wheat flour from other flours and makes a yeast bread possible from wheat flour, but impossible from the meals made from corn, cotton seed or the grain sorghums, when these are used alone.

Since hard wheat flour will make a larger loaf from a given amount of liquid and at the same time take less time in manipulation it is evident that the hard wheat from a standpoint of money and time expended is cheaper. It is possible by kneading until all the potential gluten is developed to obtain a good loaf of bread when using part flour and part some non-glutenous food stuff. In this way bread may be made with one-fifth to one-third of peanut, bran, cotton seed, corn or rice meal.

Flour on standing bleaches and has been found to give more satisfactory results in bread making. This, perhaps is the reason why people came to prefer white flour. The millers found that by treating the flour with nitrogen peroxide or electricity they could bleach it. This bleaching gave a whiter flour and a better appearing bread from new flour. There is apparently no reason why bleached flour should not not be used as the nitrites to be found in the amount of flour used by one individual in a year would not exceed a medicinal dose.

Yeasts.

Yeasts are tiny microscopic plants everywhere present in the air. In order to grow they must have moisture, warmth, and a sugar solution to feed on. We can detect the presence of yeast in any material by its action. As soon as it begins to feed on the sugar it gives off alcohol and carbon dioxide. This produces the mass of bubbles which are present in fermentation. If fermentation continues too long, the alcohol is changed

into acetic acid. Just as other wild plants have been cultivated and improved, so have yeasts been cultivated from this wild yeast in the air. The cultivated yeasts are greatly superior and are also free from other microscopic forms of life that are likely to produce undesirable flavors. There are three types of yeast in general use—liquid, dry, and compressed.

Liquid Yeast: Liquid yeast is a mixture of yeast and water with flour and salt, or with potatoes and salt. Because of the moisture and the food present in liquid yeast the yeast plants may be easily affected by the weather and are much more likley to contain other microscopic forms of life which will give a bad flavor to the bread.

Dry Yeast: Is prepared by mixing fresh yeast with corn meal, flour or starch, pressing it into cakes and drying it. This will keep for a long time, but the yeast plants are in a resting stage and it takes a greater length of time for them to begin to grow when used in bread making.

Compressed Yeast: Is made with yeast from the distillers' vats. It is thoroughly cleaned, pressed into cakes and wrapped in tinfoil. When fresh it is moist, firm and of a light cream color and the yeast plants are in a good growing condition, but it will not keep very long even in a cool place. It should never be used when mouldy spots appear or when it is soft and stringy, else the flavor of the bread will not be good. When plants are in a growing condition they are filled with a sap or juice which is merely a weak sugar solution. This sugar solution is supplied to the yeast in three ways, (1) sugar is present in the flour, (2) when the flour is wet a certain amount of it is changed to sugar by enzyme action, (3) sugar may be added.

Effect of Too Much Sugar.

When over two tablespoons of sugar to the cup of liquid is used a decrease is seen in the size of the loaf and a corresponding increase in the length of time required to raise it. This is because of the reversal in the direction of the flow due to osmotic pressure produced by the pressure of the highly saturated sugar solution surrounding the yeast cells. This would be equally true of salt solutions within smaller limits.

Effect of Fat.

Fat produces a tender, better flavored crumb, but if more than two tablespoons to a cup of liquid is used the growth of the yeast is retarded.

Effect of Temperature on Yeast.

Eighty degrees F. or a little below blood heat seems the best average temperature for the growth of the yeast plants. At a temperature above blood heat (100° F.) the yeast is weakened and at the boiling point it is killed. At a temperature below 80° F. the yeast does not develop rapidly enough and other organisms (bacteria and molds) contained in the flour have an opportunity to flourish and form products which give the bread an unpleasant flavor.

Effect of Egg on Yeast.

The yolk of an egg seems to stimulate the action of the yeast plant and an increase in the size of the loaf results.

Effect of Yeast on Flavor.

The amount of yeast used in a loaf of bread is determined by the amount of sugar, fat, fruits, etc., used, by the temperature of the air, and by the time that can be allowed for rising. As many as four yeast cakes to the loaf may be used without impairing the flavor of the bread if care is taken to see that it never more than doubles in bulk. With proper temperature conditions, bread may be ready to bake or rolls may be baked and out of the oven in two hours if three (Fleischman's) yeast cakes are used for each cup of liquid. Two yeast cakes give an excellent loaf. The cost of the loaf increased in proportion to the number of cakes used, and it is unnecessary to use so many except in an emergency. One yeast cake will make four loaves of bread, but more time for rising must be allowed. Bread may be made and baked in less than six hours by allowing one-half yeast cake to a loaf of bread.

The kind of yeast one may use with good results depends upon the time at one's disposal. When any form of dry yeast is used the bread will rise more rapidly if a cup of sponge saved from a previous baking is added.

The Effect of Kneading and Several "Raisings" on Bread.

Much kneading and many "raisings" produce a much finer texture and a more attractive loaf, though this does not increase the dietetic value of the bread. The kneading develops all of the gluten and distributes the air bubbles evenly, thus producing the finer grain. When dough has doubled in bulk three or more times a whiter, silkier, more elastic crumb results.

Bread which is poorly expanded and half baked cannot be completely digested. There is not only an economic waste involved, but the health of the family fed habitually upon such bread might be seriously impaired. In good bread the starch grains are perfectly expanded and in a soluble form, some of the starch has been changed to sugar and some of the sugar caramelized.

Chemical Changes Taking Place in Bread Making and Baking.

During the growth of the yeast plant, starch is changed to sugar and sugar is changed to alcohol and carbon dioxide. It is the expansion of this gas which stretches the elastic gluten and so brings about what we term the "raising" of the loaf of bread. If allowed to set too long before kneading, the alcohol may become changed to acetic acid and thus produce sour bread. If bread is never allowed to more than double in bulk this change will not occur. During the baking process the starch grains are well expanded, a small amount of the starch in the crust is turned into dextrine, the alcohol and carbon dioxide are driven off and a certain amount of the fat is oxidized.

The additional raising of the bread after it is placed in the oven does not of necessity mean further chemical change, but that the gases are obeying the law for the expansion of gases

and expanding 1/273 of their volume for every degree Fahrenheit.

Methods of Making Bread.

There are two methods of making bread—the sponge method and the dough method. In the sponge method the liquid, sugar, yeast, and half the flour are made into a batter which is allowed to set until it doubles in bulk before it is made into a stiff dough. This method is best when dry yeast or a small amount of soft yeast is used.

In the dough method the bread is made into a stiff dough at once. This method is the most desirable if as much as one cake of soft yeast to the cup of liquid is used.

Bread—Sponge Method.

1 cup scalded liquid
1 tablespoon fat
1 tablespoon sugar
3½ cups flour (or enough to make a dough stiff enough to knead without sticking to the board or hands),
¼ cake yeast
1 teaspoon salt.

To scalding liquid add the sugar, salt and fat. When this mixture is lukewarm add the yeast cake, softened into a paste in one tablespoon of cold liquid, and one-half the flour. Beat this mixture well and set it in a pan of warm water until it doubles in bulk. When the sponge has doubled in bulk add flour until the dough is stiff enough to remove to the moulding board to knead. All of the flour in the bowl should be worked into the bread, leaving the bowl clean. Knead the bread for ten minutes and turn over in the bowl, which has been washed perfectly clean in cold water and drained, but not dried. This gives a moist surface and prevents a crust from forming. When a crust forms and is kneaded into the bread dark streaks result. When this dough has doubled in bulk cut it down. When it doubles in bulk the second time mould it into a loaf, place in a greased pan and cover well. The bread should be a rounded

loaf when placed in the pan and should not be forced into the corners but allowed to adjust itself in the pan. The bread should not quite double in bulk before it is placed in the oven if a close grained loaf is desired. The oven should be hot enough so that the loaf begins to brown in ten minutes and is a beautiful golden brown in twenty minutes. At the end of forty-five minutes the loaf of bread should shrink from the pan and the crust be firm enough to resist indentation from gentle pressure.

If a crisp crust is desired the bread should be cooled in the air. If a soft crust is desired the loaf may be brushed with fat and covered. So far, experimenting has shown that there is no undesirable result from covering warm bread with porous cloth or paper.

Bread—Dough Method

Use the same amounts of materials using ½ yeast cake instead of ¼, and make the bread stiff at once.

Rolls

If rolls are desired use twice as much sugar and fat and do not knead the dough after the first rsing before forming the rolls. It is well to allow the rolls to double in bulk and then put them in the ice chest until it is time to bake them. The oven for rolls should be very hot. When they begin to brown brush lightly with fat and continue baking. Rolls should not touch each other in the pan but should have a perfectly browned crust over the whole outside. The dough made from one cup of liquid should make twenty-four family sized rolls or forty-eight reception rolls. The raised dough may be rolled out lightly with a rolling pin to ¼ inch in thickness, cut out with a biscuit cutter, and each roll brushed lightly with melted butter or peanut oil. Fold, allowing the top to overlap the bottom so that the roll does not spring open in rising. Allow to double in bulk before baking.

Variations in Flour

The flavor and food value of bread may be greatly altered by substituting other flours or food stuffs for wheat flour. Cottonseed flour, with a protein content much higher than the leanest cut of meat, makes an excellent substitute for one-fourth of the flour. This bread dries out very rapidly but this may be overcome by adding one cup of a standard cornmeal mush.

Variations in Liquid.

The flavor of bread may be greatly altered by using teas, fruit juices or buttermilk whey. Tea made from English saffron, using one rounding teaspoon of saffron to one cup of liquid will give a delightful flavor and color to bread.

Fancy Breads

The following breads form wholesome sweets for the children:

German Sweet Bread

Take one loaf from the baking of bread, add to this raised dough one-half cup of sugar, one-half cup of fat and one teaspoon of cinnamon. When this has been worked in, roll or pat the dough out into a baking pan. The dough should be about one inch thick and the pan about two inches deep. When the dough has doubled in bulk push the index finger through the bottom, making wells about one inch apart, fill the well as soon as made with sugar flavored highly with powdered cinnamon. After making and filling the wells drop melted butter on each and when the mixture raises until it springs back from an indentation made with the finger bake it slowly for thirty minutes.

Swedish rolls may be made by rolling this dough to the thickness of one-half inch, brushing with fat, sprinkling with sugar, cinnamon, currants and nuts, if desired, and rolling like a jelly roll. Cut pieces about 1½ inches deep from this roll, lay

flat in a buttered pan, when doubled in bulk bake. Baste with honey while baking.

Glazed Current Buns

1¼ cups of scalded cooled milk
3¾ cups of bread flour
¼ cup of sugar
¼ cup of melted fat
½ teaspoon salt
1 egg
½ cup of cleaned currants
2 level teaspoons of corn starch
¾ cup of boiling water
Granulated sugar
Cinnamon if desired

When the milk is lukewarm add the yeast cakes. When they are thoroughly softened add the remaining ingredients and beat well for ten or fifteen minutes. Allow to rise until doubled in bulk then set in the ice box over night. In the morning turn onto a floured board and roll into rectangular piece ¼-inch thick. The mixture is not stiff as bread dough and must be handled while cold. Brush this piece with butter and fold from ends toward center to make three layers. Cut off strips ¾ to 1 inch wide, cover and allow to double in bulk. These strips may be twisted and braided or they may be coiled. If braided sprinkle well with almonds before baking. Bake in a hot oven about twelve to fifteen minutes. When removed from the oven brush with melted fondant. This dough may be baked in tiny timbale molds and eaten with marachino cherry sauce.

Breads Using Wheat Flour Substitutes

Cottonseed Flour Bread

3 cups flour and 1 cup cottonseed flour sifted together.
1 c. scalded liquid
1 tbsp. sugar

1 tbsp. fat
1 tsp. salt
1 yeast cake
Proceed according to general methods for bread making.

Oatmeal Bread

c. oatmeal (cooked very stiff)
¼ c. sugar
1½ tsp. salt
1 cake yeast dissolved in 1 cup lukewarm water
1 tbsp. shortening
Flour to make a dough

To the lukewarm water add the fat, sugar, salt and dissolved yeast; add the oatmeal and flour. Knead thoroughly let double in bulk, shape into loaves; let rise and bake one hour.

Peanut Bread

1 tbsp. sugar
1 tsp. salt
1 tbsp. shortening
1 c. scalded liquid
1 yeast cake
1 c. roasted and hulled peanuts
3 c. wheat flour

Break peanuts into small pieces and mix thoroughly with the flour. Proceed according to general methods for bread making.

Sweet Potato Bread

6 c. sifted flour
2 c. mashed potatoes
¾ c. lukewarm water
1 yeast cake
1 tbsp. sugar
1 tbsp. salt
2 tbsp. shortening

Wash thoroughly and boil in their skins five sweet potatoes of medium size. Cook until they are very tender. Drain, peel, and mash them while hot, putting them through a colander to free the mass from lumps. Allow the mashed potato to cool

until lukewarm. To the cool mashed potato add the yeast, which has been rubbed smooth in ¼ cup lukewarm water. Add the salt, sugar and about two cups of the flour. Mix thoroughly, cover and place the bowl containing the mixture in a warm place and allow to rise until very light. To this sponge add the shortening and remainder of the flour. The dough must be very stiff as the potatoes cause it to soften as it rises. Let rise until light then follow directions for molding and baking as given above.

Rice Bread

1 tbsp. sugar	1 yeast cake
1½ tsp. salt	1 c. cooked rice
⅔ cup lukewarm water	2½ c. wheat flour

Follow general rules for bread making.

Cornmeal Mush Bread

1 tbsp. sugar	1 yeast cake
1½ tsp. salt	1 cup mush
⅔ c. boiled water	2½ to 3 cups flour

Put ½ cup cornmeal into top part of double-boiler, with one cup water; mix thoroughly and bring to boiling point, stirring frequently. Cook until mush is quite thick. Cool it until lukewarm and make the bread according to the directions for sweet potato bread from the point where the yeast, etc., is added to the cooled mashed potato.

Kafir Corn Yeast Bread

2 cups Kafir corn meal	3 tsp. salt
2 cups water	Wheat flour
2 tbsp. sugar	1 yeast cake dissolved in
2 tbsp. shortening	¼ cup lukewarm water

Cook the meal, sugar, salt, water together in a double-boiler for an hour; add the fat and cool. Stir in the yeast mixed with

a little water. Add enough wheat flour to make a soft dough (about 1 cupful). Turn onto a board and knead thoroughly. Form into a loaf and put in a warm place to rise. When light bake in a moderate oven.

Nut Bread

¾ cups scalded milk (cooled)
1 yeast cake
1 tsp. salt
1 cup nuts
2 tbsp. molasses
2 tbsp. shortening
½ c. whole wheat flour
2 ½ cups white flour

Make as ordinary bread, adding the nuts to the scalded milk.

B128-817-1m

University of Texas Bulletin

No. 1733: June 10, 1917

WATER SUPPLY AND SANITATION

Papers Presented during Municipal Engineers' Week at the University of Texas, February 13-15, 1917, under the Auspices of the Department of Engineering

Published by the University six times a month and entered as second-class matter at the postoffice at AUSTIN, TEXAS

The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston

Cultivated mind is the guardian genius of democracy. . . . It is the only dictator that freemen acknowledge and the only security that freemen desire.

Mirabeau B. Lamar

TABLE OF CONTENTS

PAGE

STREAM POLLUTION .....
.....*By V. M. Ehlers, State Sanitary Engineer* 5

A DRY CLOSET SYSTEM.....
.....*By Ed H. McCuistion, Mayor of Paris, Texas* 10

BACTERIOLOGY AND SANITATION.....*By I. M. Lewis, Associate Professor of Botany, University of Texas* 16

FILTRATION AND STERILIZATION OF WATER.....
.....*By R. G. Tyler, Adjunct Professor of Highway and Sanitary Engineering, University of Texas* 23

SEPTIC AND IMHOFF TANKS.....
By M. C. Welborn, City Engineer, Austin, Texas 32

A paper on *Activated Sludge Sewage Disposal* was read by F. A. Wilson, of the San Marcos Utilities Company, but a copy of the paper was not available when this bulletin went to press.

A paper on *Street Lighting,* read by Professor J. M. Bryant, of the School of Electrical Engineering of the University of Texas, will appear later as a separate bulletin.

STREAM POLLUTION

STATE REQUIREMENTS AS TO SEWAGE DISPOSAL

By V. M. Ehlers, State Sanitary Engineer

[*Synopsis:* Why pollution of streams should be restricted; requirements of the law; method of procedure of a municipality under the Act; plans are not approved by the Board of Health, but the effluent is passed upon and must come up to certain standards; what determines standard of purity for any given case; necessity of sterilizing all effluents from disposal plants; results already attained.]

For the conservation of the public health, of our water supply; in order to protect our fish and oyster industry, our live stock industry; to promote truck farming and irrigation; to comply with the navigation laws; and for aesthetic reasons, state regulations as to sewage disposal are imperative.

According to one of our leading sanitarians, "No animal can live too closely to his bodily wastes, nor has he a right to pass them on to his neighbors." In this age of preparedness, Senator McNealus foresaw the eventuality that would transpire if a check were not placed upon stream pollution. Up to the present time, with only a small number of cities sewered, several streams had become so polluted as to become foul and a nuisance to the people living along the stream. Fish life was destroyed, and oyster beds were jeopardized. Typhoid epidemics were conclusively traced to stream pollution. A number of our towns depend upon streams for water supply. A few of them have water treatment plants, but, still, the raw water, without pollution restricted, may become too great a burden for the plant. Several truck gardeners were forced to abandon their plans, perhaps mainly due to public opinion, which arose against the polluting matter in the water used for irrigation. Complaints have been many from farmers relative to the pollution of their stock water. In order to make our rivers navigable, pollution must be restricted. From a public health standpoint, pollution must be restricted.

The intent of the commonly so-called "Stream Pollution Act" is to preserve the purity of our water supply. This includes all water courses or public bodies of water from which water is taken for the use of the farm, for livestock, drinking, and domestic purposes. Under its provisions, it is unlawful to discharge untreated sewage, factory and dairy waste, or to dump dead animals, garbage, night-soil, or any unclean, poisonous, or filthy matter, upon the watershed or into a water course or any public body of water, so as to impair the natural quality of the water. This Act is applicable to all persons, firms, corporations, municipal and county institutions, located within the corporate limits of cities and towns.

Cities and towns located on tide water are exempted, but cities and towns located on the Rio Grande, Canadian, Pecos, and Red Rivers come within the provisions of this Act. A violation of the provisions is punishable by a fine of not less than one hundred ($100) dollars nor more than one thousand ($1000) dollars. Upon the conviction of any person under the Act, it becomes the duty of the court to issue a writ of injunction enjoining such persons, corporations, or authorities responsible for such pollution from continuing the same. It becomes the duty of the State Board of Health to enforce the provisions of this Act. Mr. N. M. Baker, editor of the "Engineering News," and other Eastern engineers have interpreted the above as drastic. Conditions, however, are materially different between our state and the Eastern states, ours being an agricultural state, while the Eastern states are more adapted to manufacturing. Our riparian owners make use of the streams by taking water from them, while the Easterners, on the other hand, use the stream by discharging factory wastes and partially treated sewage therein.

Several towns are handicapped on account of their bonded indebtedness from meeting the requirements of the Act. No provisions are made for financing the construction of sewage disposal works. Plans submitted to the Board of Health, in accordance with their regulations, are examined and criticised. No plans are approved, but, if found meritorious, the following

statement is given: "The plant, if constructed in accordance with the plans as submitted, and properly operated and maintained, will, in our opinion, render an effluent that will be satisfactory to this department." By this method of procedure, it is hoped that the various treatment work will be properly operated and maintained. Authorities will be held responsible for the character of the effluent coming from the plant under jurisdiction at all times. All conservative mayors and responsible engineers submit their plans. It is the freak and the promoter who avoid this feature, and, as a consequence, the community will bear the burden. It is, therefore, well to counsel with the State Board of Health before starting construction. But, in the opinion of the writer, the authority to reject plans should not rest within the hands of one man.

The Act became effective January 1, 1917, and since its passage an unprecedented record of sewage treatment works construction has followed. All plants constructed are not perfect; the department has not been able to comply with all the demands made upon it. We have found well designed plants carelessly constructed: in one case, the tanks were constructed of materials that leaked like a sieve; in another case, the plans submitted were only partially followed out.

For the guidance of designing engineers the following regulations have been prepared.

(1) That, for each river and waterway, at any given point, there shall be a minimum limit standard of purity, and this minimum limit is dependent upon the amount of sewage effluent discharged. The reasons for this limit are not the same in all cases, but vary according to the use that is made of the river, or the water of the river, and according to the character of the territory through which it flows. No universal standard of purity can be wisely established or maintained.

(2) That, while no universal standard of purity can be established, it is believed to be feasible to establish and maintain appropriate standards of a general nature for waters that fall within certain groupings.

(3) That sewage waste matter, before being discharged into

any river or waterway, shall be purified to such a degree as not to affect health in any way by a reasonable use of the river water; or to cause sensible offense to public decency; or to cause material injury to the fish or shellfish industry; or to cause the silting up of channels of navigable streams.

(4) That, even when the demands of public health, decency, and protection to the shellfish industry are such as to require a high standard of purity, the economic aspects of the case should be considered, the fundamental principle being that the results accomplished shall be reasonably commensurate with the cost of prevention of pollution.

(5) That, inasmuch as the safety of public water supplies is the most important element in the problem of stream pollution at the present time, the following general principles should govern the discharge of sewage effluent and waste matter into the rivers and waterways:

(a) Streams from which water supplies are taken without purification should not receive any sewage effluent or waste that will render the water a menace to health, or otherwise impair its natural quality.

(b) Streams from which water supplies are taken and used for purification should not receive a sewage effluent or waste of such character as to put an unreasonable burden upon the purification works at any waterworks plant.

(c) Streams not used for water supplies may receive sewage effluent of such character that its entrance will not sensibly offend decency in the reasonable public use of the stream, or cause interference with valuable fish industries.

(d) Harbors and tidal estuaries may receive sewage at such places and in such amounts that the discharge does not principally offend decency in the reasonable public use of the water, or cause interference with navigation or with valuable fish or shellfish industries.

Temporarily:

(1) Streams from which water supplies are taken (or may be taken in the future), below the point of discharge, may receive sewage effluent having a stability of 96, according to the methylene blue test, and a bacterial elimination of (this point

to be specified by the State Board of Health in each particular case). Apparatus for disinfection of the sewage effluent shall be provided.

From the above regulations, you can see that no drinking water standard is required, and that the board is in accordance with the engineers when it states that the results accomplished shall be reasonably commensurate with the cost of prevention of pollution. However, the board places a considerable value upon the prevention of pollution, and rightfully it has done so.

Frequently we hear the Act criticised for not placing the same restrictions on the rural districts as on incorporated cities. The farmer of today realizes the importance of properly disposing of his sewage. Much work has been done along this line in recent years by the State Board of Health and the International Health Commission. The Legislature, in its wisdom, has been most liberal in providing for rural health work, and we earnestly hope for the time when the unsanitary dry closet is a thing of the past in this state.

Barnyard drainage reaches streams during high stages, which, while not desirable, is not nearly so dangerous to public health as human wastes.

The results accomplished up to the present writing have been more than satisfactory. Much, however, is left undone; the study of our streams, their powers of self-purification, and experiments on different methods of sewage treatment are needed. The Act has also been an educational one, has been conducted upon a moral plane, met with the approval of welfare associations, and is today responsible for much of the activity along water purification, garbage incineration, and other lines of sanitation in this state.

City officials and engineers deserve much credit for what has been accomplished.

A DRY CLOSET SYSTEM

By Ed H. McCuistion, Mayor of Paris, Texas

[*Synopsis:* Type and size of pail and lids used; description of collecting wagon, dumping station, and arangement for cleaning buckets; system of card indexing used; use of liquid disinfectant recommended; pails collected during day in preference to night; cost and frequency of service; fly breeding.]

The courtesy of a place upon this program was not extended to me because of any special engineering skill or equipment for handling this subject, but rather because the city with which I have been intimately identified for more than ten years has inaugurated a pail system with which dry closets are equipped that has elicited favorable comment. In discharging the obligations imposed by this courtesy, I shall briefly describe the various features of the system to which reference has been made, and then emphasize such of them as may appear most practical and commendatory.

The pail used is made of 24-gauge galvanized iron throughout. At its mouth, its metal is turned over a ⅜-inch iron rim, and a bail of the same dimension iron is used with which to handle it. At the bottom of the pail the metal is crimped in such a way that a rim is formed which prevents the bottom from dragging or scouring on the floor when the pail is in use. The ears are firmly and securely riveted. The lid is slightly cone shaped, and the tongue of the lid slightly crimped, and fits closely into the pail, and all lids are interchangeable among the buckets. The wagon has low wheels and broad tires, should have the cut-under feature, and ours provides for the accommodation of sixty-six pails, on two decks, with three pails abreast. The dumping station, in its outside appearance and size, resembles an ordinary corrugated iron garage. It is floored with concrete, with a well in the center, to which drainage from every part of the structure points. The well is equipped with a man-hole cover, thereby enabling the service wagon, as it approaches with a load, to drive over it, where

the stop is made, and the pails are unloaded on the concrete floor. Then the wagon is carefully washed with hose and water under pressure, whether soiled or not, all drainage going by gravity to the concrete well, directly connected with the sanitary sewer system.

Immediately adjacent to the dumping station are drying racks and a vat in which all pails are carefully and thoroughly washed, then placed in the drying racks for air and sunshine, before again re-entering actual service.

Before work is begun, a sanitary survey of the entire city should be made, and a card prepared showing the streets, house number, and the number of persons served on the different premises by the proposed dry closet. These cards are filed in the office of the Sanitary Commissioner by streets, and one pail is provided for each five persons. When the service wagon is loaded with empty pails for a trip, a batch of cards corresponding to the exact number of pails on the wagon is given to the driver by the Sanitary Commissioner. These cards are arranged in the order in which the premises will be reached by the driver as he goes into the field. Each card discloses whether there is one or more pails on the particular premises. When the first premises are reached, if two pails are to be installed, the driver takes out the two pails that have been in service, removes the lids from the clean ones and places them upon the pails so removed, puts in the new ones, and returns to his wagon.

This, brief as it may appear, is a bare statement of the essentials of the pail system so successfully employed in Paris.

This plan of handling the dry closet was devised under the belief that it eliminated many of the obnoxious features common in all of the conventional methods in general use. In the first place, the size of the pails employed and their manner of installation reduce the expense of converting the average closet in general use to a mere minimum. The size of the pail is such that, when filled, a laborer can easily carry two without feeling himself overloaded, and place them on the wagon without inconvenience. Being comparatively small, they are more easily washed, more perfectly cleaned, and handled with

greater facility at every step throughout the service circuit they make. The wagons used were built especially to fit the requisite number of pails, were double decked, and thereby thought to meet all the requirements most essential to general service. Experience, however, has demonstrated that a single deck would prove more practical, and that curtains, or tarpaulins of some kind, which would obscure the pails, would also prove beneficial. The new wagons which we now have under construction, embodying the above mentioned features, will, in our judgment, prove quite superior in many respects to the old ones in use. The advantages of a pail system over others in common use are many. In the first place, it avoids all soil pollution of every character. The use of a liquid disinfectant and deodorant in the pails when placed in service assists very materially in preventing fermentation, thereby reducing odors to the minimum, and also in keeping away flies during the summer; and, where the service is prompt and the regulations for use are observed, the system is very acceptable.

It is necessary that toilet paper be used. If newspaper, rags, cotton, or similar accessories be employed, the fly breeding will not be eliminated. The use of a liquid disinfectant in the pail, to begin with, furnishes a favorable field for the reception of all waste matter, and one into which flies and other insects cannot go. The use of toilet paper, which speedily liquefies, very effectually prevents any waste matter from remaining exposed above the surface of the germicidal fluid in the pail and becoming accessible to flies, which may scatter intestinal infections from it as well as breed in it. It is a well-known fact that, in the ordinary open closet, where the ground is the receptacle, soil pollution for a considerable distance around the closet is so general and so obnoxious that every such closet is a real menace in the community. If vaults are installed, or boxes, the waste matter deposited remains accessible to flies and other insect carriers. The expense of cleaning and the odor incident thereto are much more objectionable from every standpoint than in the case of the pail system.

Another feature of the pail system which has rendered it both more economical and more popular is that, with close-

fitting lids and pails as containers, the work may be done during the day, and the rapidity with which it is done is such that it is much more economical than the conventional methods. Previous to the installation of this system, Paris had an ordinance which required the open ground closet to be cleaned once a month, for which a charge of 75 cents was made. The work was not done by the city. The private owner of the system was driven either to work for those who paid him or to spend a good portion of his time collecting delinquent accounts. All closets which receive regular service paid $9.00 per year. Under the pail system, which succeeded the former method, two pails in a single closet were removed once every two weeks for the entire year for the sum of $4.00; or, if one pail only was used, $3.00 was the charge. No time is spent collecting delinquent accounts. All property owners are required to come to the office of the City Secretary and pay in advance, either by the year or even by the quarter, if they prefer.

It is the sincere belief of those who have most carefully observed the working of the present system that a material reduction in the number of flies which infest the city was noticed from the first summer it was installed. The observation was made in face of the fact that no systematic effort had been made to remove slop, stable waste, and other garbage debris from the residence districts of the city. The pails used cost 48 cents; the lids, 15 cents each; the wagons, as specially built, $85.00; the dumping station, probably $150.00; and a sewer service from the dumping station to a main outfall line of the sanitary sewer system, probably $250.00 more.

Briefly, this constitutes the equipment necessary to install a system of this character. It should be borne in mind, however, that there is a decided advance in galvanized iron, and that the pails would cost somewhat more than was originally paid. It should also be borne in mind by those who install this system that its chief cornerstone and indispensable requisite to its success is perfect cleanliness. Pails slovenly washed, wagons not carefully kept and left uncurtained, will prove very detrimental to the popularity and general acceptability

of the system. The installation and operation of this system has elicited a large number of inquiries from all parts of the country. Those most frequently made are:

First: "Do you screen the closets or otherwise so construct them that flies cannot gain access to the pails?"

To this, we have answered that in the original installation of the system a few closets were so screened, by way of experiment; but we found that the hinged flaps soon warped, and that the opening and closing of these hindered the men to some extent in their work. We further found that, where toilet paper only was used, there was little, if any, attraction for flies, unless the contents of the pails had fermented, which sometimes happened during the summer months. Where fermentation did occur, the mere presence of the flies was the only objectionable feature: they could not gain access to the excreted matter, because it was immersed. Of course, if newspaper, cobs, etc., were used, the presence of these in the pail gave the flies their opportunity to become contaminated and thus spread infection. The very simplicity of this system, as well as the small cost which attends the adaptation of the conventional closet to its use, is one of the features which so strongly commends it for universal adoption. Many of the closet systems now so frequently recommended involve an expenditure in the construction of a closet that is but little less than the amount necessary to make a sewer connection.

Another inquiry often received is: "Who pays the sanitary fee?" Our ordinance provides that the owner of the property is held responsible in all cases except where such owner is a minor, a non-resident, or for any other reason is beyond the jurisdiction of the Recorder's Court. In such cases, the tenant may pay the fee in the name of the owner. We also have another provision in the ordinance making it a misdemeanor for a tenant to occupy premises and use a dry closet upon which the fee has not been paid in advance. All such charges are required by ordinance to be paid in advance, and those not paid by the tenth day after the beginning of the quarter become delinquent, and such delinquency is defined as a misdemeanor and punishable by a fine which, together with the

cost, is much more than the bill. It is needless to say that, thus far, we have not found it necessary to impose but a single fine. A few arrests have been made, but the court has, after hearing the excuses, felt constrained to dismiss the cases, except in the single instance above referred to. We have sustained some losses, but these are traceable to carelessness in our clerical department, sometimes in not making a bill properly, and, in other instances, in not turning the matter over to the police department.

It is my conviction, after a careful study of a considerable number of dry closet systems, that the one we supply is, when all features are fully considered, decidedly one of the most practical and workable. Its easy, inexpensive adaptability to all communities where the conventional closet is in use, it seems to me, is one of its strongest claims to public favor.

It should be remembered constantly that this system is not intended to supplant or to retard the connection of premises with the sanitary sewer system. No system of which I have any knowledge can, in any legitimate sense, be said to justify this. All dry closet systems are makeshifts, and should be so regarded.

BACTERIOLOGY AND SANITATION

By I. M. Lewis, Associate Professor of Botany, University of Texas

[*Synopsis:* Parasitic and non-parasitic bacteria; effect of environment upon growth of pathogenic bacteria; five avenues through which bacteria may be thrown off by a diseased individual; routes of transmission and portals of entry to the system; water and milk as routes of transmission of disease; advantages and disadvantages of pasteurization.]

Bacteriology, the newest of the natural sciences, is altogether modern. Although bacteria were first discovered more than two hundred years ago, their importance in nature was not clearly understood until very recent times, and new additions to our knowledge of them are being made almost every day.

Bacteria are very minute vegetable organisms which, like all other plants and animals, consume food, grow, reproduce themselves, and are influenced in their life processes by their environment. They are widely distributed in nature, being present in great numbers in the soil, in water, in milk, in foods, in the air, as well as in and upon the bodies of plants and animals.

Bacteria may be roughly divided into two great groups, on the basis of whether they are parasitic or non-parasitic for man. The non-parasites are very much more abundant than the parasites, and their life habits are quite different. They are the organisms that are concerned with the work of decomposing organic substance. They make possible the existence of all other forms of life, for, if it were not for decomposition, the elements necessary to sustain life would soon become locked up in compounds and could not be released. The work of these organisms is of great importance from the standpoint of sanitation.

Parasitic bacteria bear a close relationship to the animal on which they live, and are usually highly specialized as regards their life habits. Such organisms have become accustomed to growing at the temperature of the animal body, and to using only certain foods; and they are, as a rule, unable to adapt

themselves to other conditions. They are at home only while in the animal body, where they grow, multiply, and produce the chemical poisons which cause disease.

A knowledge of the behavior of pathogenic bacteria after they are expelled from the body is of supreme importance to students of sanitary science. It was long believed that these pathogenic forms, after leaving the body, continued to grow and multiply and lead a saphophytic existence, much as the non-pathogenic forms do. This has, however, been found to be erroneous, except in a few special cases. The great majority of organisms capable of causing disease are not at home in the lifeless environment outside the animal body, and are not only unable to grow and multiply, but can survive for only a limited time in external nature. Some of them are able to resist such conditions much longer than others, and upon a knowledge of this fact certain sanitary measures are based. The bacillus of influenza and the gonococcus, for example, die very quickly; while the tubercle bacillus and the typhoid bacillus are much more resistant, and have been known to survive for months. The anthrax spores may live on the wool of sheep for several years, and then prove capable of transmitting this disease.

There are a few special cases in which organisms capable of causing disease are known to grow and multiply in the soil. The best known example of this is the anaerobic bacillus responsible for tetanus. This organism is a normal inhabitant of the intestines of the horse and sheep. The spores are capable of great resistance, and multiplication takes place after the same manner as other soil bacteria. Such cases are, however, the exception, and not the rule.

It follows, then, that infection in most cases depends upon contact, either directly or indirectly, with material recently cast off from the body of a diseased individual. We may conveniently consider the subject of sanitation by noting the avenues through which organisms are discharged from the body, the routes of transmission, and the portals of entry to the body. These points will be found to vary somewhat in different diseases.

There are five chief avenues through which bacteria are thrown

off from the body of a diseased individual. They are: the feces, the urine, the blood, the sputum, and the skin. Diseases may be grouped into classes more or less accurately on the basis of the avenue by which the causal organism leaves the body. It is obvious that intestinal diseases leave the body principally through the feces, that eruptive diseases are thrown off from the skin, while diseases of the mouth and throat are carried away by the sputum. It can not be over emphasized that these substances are the original primary bearers of diseases.

The chief routes of transmission are water, air, insects, milk and other foods, and contact or droplets. It is customary to speak of diseases as water borne, air borne, insect borne, milk borne, or contagious.

The portals of entry to the body are: the alimentary tract, the respiratory tract, the genito-urinal tract, and the skin through wounds or bites of insects. It is obvious that the chief duties and responsibilities of the sanitary engineer are to erect efficient barriers to these routes of infection. This is by no means a small task, and his success depends in a great measure upon the intelligent cooperation of all members of society.

It is only very recently that we have possessed knowledge of the various routes of infection. What we regard today as commonplace information was unknown a few years ago. We hear all classes of society speak of the relation of insects to transmission, of the malarial and yellow fever mosquito, and of the typhoid fly; yet this relationship was only recently discovered. Likewise, tick-transmitted fever and the relation of fleas and lice to disease transmission, although now well known, are recent acquisitions to our knowledge.

That water is one of the principal routes of transmission has been known longer, and methods of water purification are well established. That running water purifies itself has been found to be unsafe as a sanitary precaution in polluted streams, and purification by means of sand filtration is now known to be the only reliable safeguard against polluted water. No city can afford to use raw untreated water from a running stream, for such streams are likely at all times to become polluted. The process of sand filtration is of great interest from the stand-

point of the bacteriologist. The object of filtration is to remove any parasitic bacteria that might be present. The sand filter does this very effectively, as has been shown by numerous experiments of cities that use this method. The purification of water by sand filtration is due to the action of non-parasitic bacteria, which become established as a zoogleal mass in the surface layers of the sand. This mass tends to retard the passage of the organisms originally present in the water, and it passes through with a greatly reduced bacterial content. Filtration through sand depends, therefore, upon the bacterial flora of the filter.

Another of the important routes of transmission is the sputum. To control the spread of saliva is one of the most difficult of all sanitary problems. We are accustomed to think of this problem in terms of anti-spitting ordinances, but this is not the only way in which such diseases as are carried by the saliva may be spread. There are, so far as I am aware, no laws against coughing or sneezing which we are bound to respect. Neither can we prevent people from placing their fingers to their lips to moisten them and then immediately after touching door knobs, leaves of books, or from performing any of the thousand and one operations which deposit organisms from the mouth and throat upon surfaces which may be handled by another individual a moment after. This second individual is almost certain to perform the similar operation of moistening his finger tips, and, in so doing, inoculates himself with living virulent organisms.

The spread of such diseases as diphtheria among school children is readily traced to the ease with which they exchange their saliva. Trading lead pencils, which they invariably place in their mouths, drinking from the same cup or from an unsanitary drinking fountain, coughing, sneezing, etc., are but different methods in this transfer of organisms in the saliva of the sick to the well.

There is a growing belief that infection in the case of tuberculosis is due primarily to fine droplets of saliva thrown out by the tuberculosis patient in the operation of coughing or sneezing. These fine droplets are readily demonstrated if one will

talk or cough while holding a mirror directly in front of the mouth. These droplets remain suspended in the air for a considerable time, and, since the organisms are kept in a moist condition, they are more apt to retain their virulence than when dried, as in pulverized sputum. Droplet infection, as well as some of the other methods mentioned above, is almost impossible to control. A realization of the dangers from such infection might, however, lead to sanitary precautions which would reduce such dangers to the practical minimum.

Milk furnishes an important route for the transport of disease. The harmful organisms in milk are derived either from the cow herself or from unsanitary methods of handling the milk after it is drawn. Milk is a more dangerous vehicle of disease than water, for the reason that it is a suitable culture medium for many of the bacteria which cause diseases. A few such organisms having been introduced into the milk at the time of milking, or from vessels that had been washed in polluted water, might multiply enormously, and such milk would become accordingly very highly dangerous.

Various standards have been set up by city boards of health concerning the degree of purity required for market milk. It should be borne in mind, however, that from the standpoint of public health all bacteria in milk are not of equal importance. The highest standards of purity permit a certain minimum number of bacteria, usually less than 10,000 per cubic centimeter. The maximum number is usually placed at 500,000 per cubic centimeter. A market milk might readily pass these standards and still contain virulent organisms capable of transmitting diseases.

The bacteriological analysis of milk is of some value in determining the relative conditions of sanitation under which it is produced, but it does not take the place of a rigid inspection of the dairy. A bacteriological analysis of milk is by no means as satisfactory a check on its purity as is the same analysis of a water supply.

The best safeguards for the milk supply is sanitary production. The cows of all dairies supplying milk to the public should be inspected for tuberculosis and health of the udder.

The milker should be a healthy, cleanly individual. The water supply of the dairy must be free from possible sources of pollution, and all bottles and milk vessels must be washed clean and treated with live steam. No bottle should be filled while out on the route, as this is almost sure to result sooner or later in the filling of an infected bottle from some household where there is a case of communicable disease.

The process of pasteurization of milk is often employed to insure against infection, but this process has certain disadvantages. It happens that the parasitic organisms which find their way into milk are all destroyed at the temperatures used in pasteurization, and this, of course, is highly desirable. But the organisms which bring about the normal souring of milk are likewise unable to resist this temperature. This would be very well if it were not for the fact that certain heat resistant bacteria are always present in milk. These forms do not cause either diseases or the souring of milk, but are responsible for decomposition. These forms are not able to multiply for any length of time in unheated milk, for the reason that the acid produced by the milk-souring organisms inhibits their growth. However, when this inhibitory influence is removed through the destruction of the acid producers, the milk, if not kept thoroughly chilled, is liable to decay, and thus form poisonous decomposition products. Pasteurized milk will not sour normally. The danger from such poisonous decomposition products is far greater in pasteurized than in non-pasteurized milk. This method should be resorted to only in extreme cases. Clean milk produced under sanitary conditions is the ideal which should be set up.

The problem of conserving the public health is a problem in which all members of society are obliged to cooperate if the best results are to be obtained. Intelligent cooperation depends upon a knowledge of the known laws of disease transmission. The accompanying chart* illustrates in graphic form the mode of transfer of parasites from one host to another, the means of prevention, and the responsibilities of the various members of society. The duty of every individual is to cooperate in

*Not reproduced here.

strengthening each barrier and each line of defense against communicable diseases. It has been said that a public utility is a public danger, but this is not necessarily true. The public milk or water supply becomes a public danger only if the public authorities are derelict in the performance of duty. A public commodity may and should be made a public safeguard against disease. This result is, moreover, only to be obtained if the public officer regards his position as a public trust and not a public graft.

FILTRATION AND STERILIZATION OF WATER

By R. G. Tyler, Adjunct Professor of Highway and Sanitary Engineering, University of Texas

[*Synopsis:* Increased activity in water purification due to enlightenment of public on sanitation; typhoid death rate as affected by water purification; preference of rapid to slow sand filters; what takes place in the filter; necessity of skilled supervision of filtration plants; checking operation with bacteriological tests; contamination of filters; filter trenches; sterilization; sterilization not to be substituted for filtration.]

During the past ten years the purification of public water supplies has received considerably more attention in this state and nation than ever before.

This increased activity has been due to several causes. Legislation has been enacted requiring certain standards of purity for water furnished by municipalities to common carriers. Bacteriological tests are required to be made on these supplies at stated intervals, to guarantee the attainment of this desired purity.

But this has been by far the least important factor in this advance. The demand for safe water supplies has proceeded from an enlightenment of the general public concerning modern ideas of sanitation, and particularly in respect to the spread of water-borne diseases, principally typhoid.

One of the most far-reaching laws in its effect upon purer water supplies in this state is the bill preventing the pollution of streams from sewage contamination. When the effect of this law begins to be felt, there will be a lightening of the load on all filtration purification plants.

By preventing the pollution of sources of supply in this manner, a large number of the municipal supplies of the state will be rendered more safe. But it will be necessary to continue the vigilance at these plants, just as heretofore, as there are many sources of pollution that can not be reached by legislation, however stringent.

The typhoid death rate is the best gauge we have as to improvement in municipal water supplies. There are other sanitary measures which assist in reducing this rate to some extent, but the improvement in water supplies is by far the greater influence. A comparison, therefore, of the typhoid death rate now with that of a decade ago should show the improvement in quality of water supplies during this period.

"It has been shown by Mr. George A. Johnson, M. Am. Soc. C. E., that we may reasonably attribute to water purification an average reduction of 16 deaths per 100,000 population in the 33 cities of over 100,000 population in 1910 that have introduced some form of artificial water purification. On this basis, 2,600 typhoid fever deaths are now avoided each year in these cities alone, and the saving in typhoid fever cases is estimated at 39,000 a year for these same cities."*

Considering the number of smaller cities now supplied with filtered water and the larger cities which have improved their water supplies since the above data was completed (1912), it will appear that the total saving in life in the United States will exceed this amount very considerably.

There are two methods by which a city may improve its water supply. One is to search out purer sources of supply, even at great distances from the point of use. Notable examples of cities doing this are New York City and Los Angeles. The other method is to improve the supply already in use. The population using filtered water in 1914 was 17,291,000, as against 3,160,000 ten years before, or 40.68 per cent of the urban population was served in 1914, as compared with 9.66 per cent at the earlier period.

This improvement in water supply has been brought about mainly by filtration. Here we find modern ideas outstripping the old. The rapid filter is being used in 450 cities, as against about 30 slow sand filters (1914). The slow sand filters are larger, however, and serve nearly one-half the population served by rapid sand filters. Recently, however, some very large

**Recent Progress and Tendencies in Municipal Water Supply in the United States.* by John W. Alvord, M. Am. Soc. C. E., presented to the International Engineering Congress held at San Francisco, September, 1915.

rapid sand installations have been made, as, for example, the St. Louis plant of 160,000,000 gallons capacity; and several larger ones have been designed, such as that for the Croton water supply of New York, which has a capacity of 320,000,000 gallons. The largest slow sand filter, located at Philadelphia, has a rated capacity of 240,000,000 gallons per day.

The reason for this more rapid growth of the rapid sand filter is enlightening. While the slow sand filter could satisfactorily purify the usually clear waters of the northeastern part of the United States, it could not take care of the waters of the remaining sections of the country, which contain suspended matter in considerable quantities. In fact, several of the larger slow filtration plants have found it necessary to take over some of the features of the rapid sand plant, as, for example, coagulation, which has been introduced at Washington, in spite of the fact that very long sedimentation is also resorted to. It seems very unlikely, from present tendencies, that there will be any great increase in the number of slow sand filtration plants during the next few years. The advantages of the rapid sand filter are so evident and pronounced that it will be used in the majority of new installations. The principal handicap which it has been necessary to overcome in the development of the rapid filter has been the objection raised by the general public against using chemicals in water for drinking purposes. This is a very real obstacle, and an engineer can still bring down a torrent of vituperation on his head by suggesting that chlorine or some of the coagulants be used in a municipal water supply. The public is becoming more familiar with the use of coagulants in water, however, and the fact will undoubtedly influence the continued growth in the number of municipalities adopting the rapid sand filters.

The principal steps in the purification of water with the aid of the rapid filter are coagulation, sedimentation, and filtration. The coagulants ordinarily used are sulphite of alumina (alum) and ferric sulphate with caustic lime. The use of alum is perhaps the more general, on account of its ease of application and comparative absence of danger from harmful effects due to unskillful handling or lack of proper care. The action of the

chemical in coagulating the colloidal suspended matter in the water and causing it to be precipitated more rapidly, is familiar to every sanitarian. Some difficulty is encountered, however, in applying the lime uniformly, as it is usually fed dry and the feeder is easily clogged by small pieces of paper from the bag, or otherwise, and it is necessary to titrate the solution of the coagulant at frequent intervals so as to know that the proper proportions are being obtained.

Whatever coagulant is used, it is very desirable to feed it, in a concentrated solution, from an orifice box where the flow can be readily measured and controlled by adjusting the head on the orifice. If piping is used, there is danger of it becoming clogged, and constant attention is necessary to obtain a uniform flow.

After the addition of the coagulant in such a manner as to insure its thorough mixing with the water as it enters the settling basin, a detention period of from three to six hours is allowed to permit the subsidence of a large percentage of the coagulated suspended matter, or flock, as it is usually called. This period of settlement varies with the amount of suspended solids and the nature of these solids, but, if it is less than three hours on waters which are at all turbid, the filters will be overloaded, and the large amount of flock passing over on to the filters will necessitate their beng cleaned at frequent intervals.

The filter itself, consisting of 30 inches to 40 inches of graded sand, with the necessary appliances for introducing the water uniformly and subdrains for removing it quickly, is far from being fool-proof. Here, indeed, skilled supervision is necessary. The filtering material should be disturbed as little as possible, as the regimen of the filter is interrupted every time this bed is broken up. It is necessary to realize that the sedimentation chamber, the filters, and the clear basin must be operated with a due regard to their relation to each other. The water level must be maintained at a constant elevation in the first, and should never be permitted to rise higher than a fixed level in the clear well, so as to keep a constant head on the filters, thereby causing a minimum amount of disturbance in the filtering material, and obtaining more satisfactory results.

These levels can be maintained by floats, attached in a proper manner to the regulating valves. The total head operating upon the filter is measured by the distance from the water surface in the filter to the elevation of the discharge into the clear well, if this is above the water level of this well. It is evident that this head is made up of both positive and negative heads. It is desirable to have the negative head as small as possible, to prevent a separation of dissolved air from the water, in the filters themselves. A total head of 10 feet to 12 feet gives satisfactory results. High heads give greater uniformity of flow.

With the high rates at which these filters are operated, being from 100,000,000 to 125,000,000 gallons per acre per day, it is apparent that frequent cleaning is necessary. This usually is accomplished by reversing the flow of water through them, either with or without the use of compressed air. This washing, which may take place as often as every twelve, but usually twenty-four hours, takes time, and thus cuts down the rate of flow through the filter. It is necessary to wash the sand only for very short intervals, as a rule,—say, five to fifteen minutes,—and the washing should be stopped before the wash water is entirely free from flock, as this is needed to settle back upon the filter so that it may operate properly. The water should then be fed into the filters again before the wash water has drained down to the surface of the sand, so as to prevent disturbing the sand. It takes considerable time, therefore, to operate the various valves necessary in washing the filters. In order to get a higher efficiency, it is not necessary to wash the filters every time they clog and check the flow of the water through them. By simply reversing the flow through them long enough to lift the mat from the top of the bed, then turning the water through again, the filters will work quite well for a time. In this way about half the washings and considerable time may be saved.

From time to time, it becomes necessary to scrape off some of the surface material in cleaning the filters, and this waste is made up from time to time by adding clean sand. The sand furnished by dealers for this purpose is frequently very expensive, if shipped a long distance. The writer has had good

success using local materials. After several washings, this sand will arrange itself from the action of the water, with the finest material on the surface and increasing in size towards the bottom. The material which is too fine may then be scraped off. Until this fine material has been removed, the surface of the filter will pack and clog quickly, so that it may be necessary to reverse the flow at intervals just enough to lift the sand, when the flow will again start.

No particular points need be mentioned in regard to the clear well, further than that it should be large enough so that it will carry over in case the filters have to be shut down for repairs. It, like the sedimentation basin, should be built with the bottom sloping to a drain, so as to facilitate washing.

The operation of the filter plant must be checked up by bacteriological tests both on the raw and on the filtered water. It is not proof that the bacteria are removed, simply because the suspended matter has been intercepted. The writer has observed one instance where the water from the sedimentation basin was very low in bacteria, while the effluent bacterial count for the filters was high. This was caused by the filter having become inoculated with some species of bacteria, which had multiplied to such an extent that the effluent from the filter contained more bacteria than the influent. This condition would not have become known, and a false sense of security would have been felt, if daily tests had not been made, both on the raw and on the filtered water.

A filter may very easily become inoculated as mentioned above, either by bacteria or by algae. In the latter case, the bed becomes matted, and the algae can not easily be removed by washing. Where this condition is in effect, it may be remedied by washing with copper sulphate or treating with chlorine. More will be said of the latter treatment later.

Before leaving the subject of filters, a few remarks are in order concerning what is known as filter galleries or filter trenches. This type of filter is not very common, but it so happens that Austin is supplied by water from four of these trenches. Here a concrete box without a bottom is sunk some 20 feet to 30 feet into the sand adjacent to the river. Quite

recently an opportunity was offered the writer to study the results obtained by the use of these trenches, in trying to locate the source of pollution of the water, which had become contaminated in some unknown way. During the investigation which followed, some quite interesting facts were brought out. The filters are located at right angles to each other. One running north and south has its south end quite near the river; the other is several hundred feet away from the river and parallel to it. It developed from tests made by the State Board of Health and the Food-Dairy Commission that the water which reaches the filters does not come from the river directly, but appears to be from an underflow parallel to the river. It was at first thought that the entire sand bed of the river was parallel, but this was found not to be the case, as the water for a considerable time would be low in bacteria, and then all at once it would increase to a high figure. The final conclusion reached as to the source of contamination was that it probably was due to water seeping into one of the filters from a very small pond in the immediate vicinity of the filters and at a somewhat higher elevation.

In the course of the investigation, the fact was impressed very forcibly upon the writer that one disadvantage of this type of filter is the many possible sources of contamination necessary to be guarded against. The wells in the vicinity of the trenches were found to have a higher chlorine content than the filtered water, and the soil adjacent to these wells appears to be badly contaminated from cesspools and surface toilets.

Then there were several possible sources of surface pollution following rainfalls. The most serious objection to the filter trench, however, appears to be the inaccessibility of its various component parts, and the lack of control over the different steps in the purification such as is had with the rapid filter, and the impracticability of cleansing the sand when contaminated. The chief advantage lies in the smaller cost of operation and maintenance. The advisability of installing a filtering trench is a question which has to be determined upon the merits of the individual case, but the above disadvantages should be kept in mind in deciding this question.

Undoubtedly, the greatest advance in water purification made in recent years is in the application of a sterilizing agent to the water to remove the bacteria. Several of these agents have been used with varying degrees of success. The ultra-violet ray, ozone, hypochlorite of lime, liquid chlorine, and ammonia have been used at different plants. The first two, which have been used in Europe more or less, have not proven economical in this country. Hypochlorite of lime, or common "bleach," has been used extensively, and with very satisfactory results. Since it is usually accepted that the sterilization brought about with this chemical is due to the available chlorine present, it appears more desirable to use the chlorine in liquid form. The amount used varies, of course, with the condition of the water to be treated. With filtered water, from 1 to 4 parts per million appears to be sufficient. Sometimes it is desirable, when used in conjunction with rapid sand filters, to apply the chlorine ahead of the filter to oxidize any algae which may be in the water. The writer has had occasion to apply chlorine in this way to kill the algae with which the filters had become badly contaminated. An application of copper sulphate had not been successful in eliminating these, but, three days after starting the chlorine treatment, the algae appeared to have been completely killed.

It would seem that there is a large field of usefulness for chlorine disinfection in the small towns, which do not use filters. If a surface supply is used, in the spring and summer algae accumulate, and produce tastes, odors, and discoloration in the water. The commonly encountered "fishy" taste is due to a species of algae. These objectionable features may be easily and economically removed by chlorine or copper sulphate.

If deep wells are used, these often become contaminated from surface water or otherwise, and even when encased, as is usually the case, instances have come to the writer's attention where the waters contained more bacteria than neighboring surface supplies. Here, again, the use of chlorine is recommended.

These remarks must not be construed as meaning that chlorination can take the place of filtration, for such is not the case. There are many small towns, however, that think they can not

afford filters that can afford the $300 to $800 necessary to install a chlorinating plant, with an operating cost of from $0.25 to $0.75 per million gallons of water treated.

During the last few months, chlorine mixed with anhydrous ammonia in equal proportions has been used. It is claimed that satisfactory results were obtained, and that the combination was cheaper than straight chlorine, on account of the low cost of the anhydrous ammonia. Some precautions must be taken when using the above mixture.

In conclusion, it appears that there is a growing tendency to overconfidence in the results obtained by filters, etc., and that many very bad waters are being treated and used when, in reality, a purer though perhaps more distant source of supply would be preferable. The guardians of the public health shoulder a heavy responsibility with reference to their water supply, and they should remember that, for every death from typhoid or other water-borne diseases, it is probable that some official has not attended to his duty and done all he could for the protection of his water supply.

SEPTIC AND IMHOFF TANKS

By M. C. Welborn, City Engineer, Austin, Texas

[*Synopsis:* Sludge problem as prime factor in disposal plant design; development of one and two-story tanks; degree of purification obtained; objections to one-story tanks, and advantages of Imhoff tanks; gas production; type of sludge produced.]

In all sewage disposal systems or processes, the sludge problem has been found to be the most difficult of solution of all the problems encountered. The principal difficulty is not so much in separating the solids from the liquids, but in finally disposing of the solids or sludge at a reasonable expense and without creating a nuisance.

It is an easy matter so to treat sewage with chemicals that a very large percentage of the suspended solids will be precipitated to the bottom of the tank and thus removed from the liquid, but, in finally disposing of the resulting sludge, we find we have to dispose, not only of the solid matter that was originally in the sewage, but also of the added amount of chemicals in the sludge, otherwise bacterial action is retarded or stopped altogether, and, unless this sludge is dried or removed at once, a serious nuisance is created.

Some cities located on or near a seacoast dispose of this sludge by loading it into barges and carrying it out to sea a distance of thirty or forty miles, while other cities dispose of it by pressing and drying and then either burning it in an incinerator or disposing of it as a fertilizer for land.

In 1860, a Frenchman named Mouras discovered that sewage sludge would be partially liquefied if allowed to remain long enough in a closed vessel, and at that time he designed what he called an "automatic scavenger," which was really an overflow cesspool. This apparatus was a closed vault with a water seal through which the sewage was allowed to pass. On account of the low velocity of the sewage through this vault, the solid matter settled to the bottom, where the process now known as "septic action" took place.

From 1860 up to the present time, many different types of sedimentation tanks have been built, in which was utilized the self-purifying action that takes place in sewage sludge. Among the noted experimenters in this line was Prof. A. N. Talbot, of the University of Illinois, who, in 1894, built a sewage tank for Urbana, Ill., in which the liquefying anaerobic action was observed, and he afterward designed and built a larger plant, with this definite end in view, for Champaign, Ill.

In 1895, Donald Cameron built, in Exeter, England, a water-tight covered basin for the treatment of the sewage of a portion of that city by anaerobic purification, and gave to it the picturesque name of "septic tank." This tank was covered, and had a submerged inlet and outlet, and every precaution was taken to make it air tight, in order to give the anaerobic bacteria the best possible chance to get in their work. This tank worked well, and Cameron promptly had the whole thing, tank and process, patented, even down to the anaerobic bacteria.

These patents immediately started trouble. The public, especially the engineering profession, felt that Cameron's system was only a slightly varied process for the utilization of an old principle, and that it should not have been patented, and these patents were generally ignored. Many suits were brought by the Cameron people for infringement of their patents, some of which possibly were pending when these patents expired a few years ago.

While the writer believes that the value of Cameron's discoveries and inventions has been very much overrated, the litigation resulting from infringements of his patents served to advertise the process widely, and to stimulate historical and scientific research work, which resulted in the compiling and publishing of an immense amount of data in regard to the "Antecedents of the Septic Tank" and to further perfecting the different processes of sewage purification, in search for some process in which infringements of the Cameron patents could be avoided.

Efforts have been made to remove the solids from sewage

by allowing it to remain quiet for several hours in large tanks, and some plants have been built to operate in this way, but the writer does not know of any such plants in existence at this time. It is now the universal custom to operate sedimentation tanks by the "continuous flow" method. In practically all of the plants where septic action is depended upon as a step in the process of purifying sewage, tanks are built for the twofold purpose of separating the solids from the liquids and of storing the solids for considerable periods under conditions most favorable for septic action.

The city of Baltimore, Md., recently constructed a sewage disposal plant in the operation of which the sludge was removed from the sedimentation tanks, or "digesting chambers," through which no sewage was allowed to flow during the digesting process. When the writer visited this plant in October, 1913, he found conditions there far from satisfactory. The walks around the margins of the sludge tanks were covered with worms that had developed in the sludge and had crawled out on to the surface and on to the walks, and the air was so filled with myriads of flies that it was inadvisable to open one's mouth to talk, and even breathing was difficult. The odor of sulphureted hydrogen was very strong. Sludge from these digesting tanks which had been on the sludge drying bed for six weeks had dried only sufficiently to begin to crack about the edges. The system then in use has since been abandoned, and hydrolytic and Imhoff tanks have been installed.

The efficiency of a septic tank is judged by its action in removing the suspended solids and liquefying the solids removed.

In order to remove the true suspended solids, it is necessary to slacken the velocity of the sewage to less than 0.1 ft. per second, and in some plants the velocity has been reduced to less than 0.01 ft. per second. In the Atlanta plant, the velocity is reduced to 0.5 ft. per minute, and this velocity, with a three-hour detention period, permits the removal of from 60 to 85 per cent of the total solids, and practically all of the settable solids.

Septic action is the decomposition through bacterial agencies of the sludge in the bottom of a sedimentation tank, with the consequent production of gases and the breaking up and partial liquefaction of the solid matter.

This action takes place whenever the sludge in the bottom of a settling tank is allowed to remain a considerable length of time. It begins a few days after the sewage starts flowing through the tank, and under favorable conditions reaches its full development within a month or six weeks. The decomposition and liquefaction of the organic matter are brought about chiefiy through the action of what are known as "anaerobic" bacteria.

While it may be that the organic matter in solution is also broken up to a certain extent, this action is confined chiefly to the solid matter, and its most beneficial results are in the reduction of the amount of solids which have settled to the bottom of the tank, and in the working over of these solids till they are in a state not subject to further putrefaction.

There is no doubt that a great amount of the deposited matter is liquefied, but this liquefying action has been and is still frequently very much overrated. It is still a common thing to meet with persons boosting some patent apparatus or process that will positively liquefy every particle of the solid matter in the sewage, will kill all the bacteria, and will turn out an effluent clear and sparkling and pure as spring water, and will continue to operate forever without any attention or maintenance expense. Before you allow yourself to be taken in by one of these artists, it will be well to remind yourself of nature's law of the conservation of matter, and remember that in all manufacturing processes there is always a certain amount of by-products.

The percentage of solids liquefied by septic action varies, because of the varying character of the sewage of different localities, because of different types of tanks, different seasons of the year, different climates, etc., but experience with well-constructed tanks has shown that it is possible to obtain a liquefaction of 40 per cent of the settled solids. This rate, however, is far above the average. An average for the year

round for any one plant of 25 per cent would be considered good.

Of the suspended solids in the ordinary domestic sewage of this country, it is possible to remove by sedimentation as much as 80 per cent, though such a high rate is exceptional and 60 per cent might be considered a fair average. In regard to the removal of solids from sewage, the action of the old style septic tank is sometimes negative. In summer, when fermentation is active, the rising gas bubbles may and often do cause the discharge of considerably more solid matter than enters the tank. Of sixteen experiments made on eight different tanks in Ohio in the summers of 1906 and 1907, ten showed negative results ranging from 0 to 43 per cent.

Until recently, it was the custom to build septic tanks rectangular in shape, rather shallow (from 6 ft. to 8 ft. in depth), and so divided with partitions and baffle walls as to cause the sewage to flow through practically the whole depth of the tank and to come into close contact with the decomposing sludge in the bottom of the tank. Formerly it was considered necessary to hold the sewage in the tanks for from 6 to 12 hours, and in some cases as long as 24 hours, or even 30 hours: but it is now customary to pass it through the tanks in 4 hours or less. These old style tanks had many objectionable features, some of which were:

(1) The gas bubbling up from the decomposing sludge kept the flowing liquid constantly agitated, interfering with the sedimentation process.

(2) It was necessary to shut down the tank, drain off the liquid, and shovel out the sludge when it became necessary to clean the tank.

(3) The sludge, after being removed, was hard to handle and slow to dry.

(4) The intimate mixing of fresh with stale sewage and the long retention period caused the generation of sulphureted hydrogen, causing such disagreeable odors that the plant had to be far removed from all human habitation, causing great expense for long lines of outfall sewer.

The first two objections were overcome in the hydrolytic

tank developed by Dr. Travis, a large installation of which was built at Norwich, England, about 1907. This tank is divided into three sections, two sedimentation chambers communicating with a reduction chamber below and between them by narrow ports through which the sludge passes. One-fifth of the sewage enters the reduction chamber directly, the other four-fifths passing through the sedimentation chambers. The designer of this tank probably had definite knowledge of the principle of liquefaction of sewage sludge later demonstrated by Calmette, who showed by experiment that the proper liquefying action takes place best in flowing sewage. Provision was made in the construction of these tanks for the drawing off of the sludge from the bottom of the tank without draining the tank or stopping the flow of the sewage through it.

All of these principal objections to the old-fashioned septic tank have been overcome by Dr. Imhoff in a tank designed by him which bears his name. The Imhoff tank is from 24 ft. to 30 ft. in depth, has a hopper-shaped bottom, and is divided into two compartments, the upper one serving as a sedimentation chamber through which the sewage passes, and the lower one serving as a liquefying chamber. The sewage passes rather rapidly through the upper chamber, and is kept fresh and free from septic action while the solids settle through the slots to the compartment below. These slots are so "trapped" that no gas can escape through the flowing liquid, but the gases generated by the decomposition going on in the reduction chamber are carried to the outer air through special vents. The proportion of sludge digested or liquefied is about the same as in the ordinary septic tanks, but the residue is quite different. The sludge which accumulates is compact and low in water content (75 per cent to 80 per cent), on account of the pressure to which it is subjected; and, on this account and because of the considerable amount of gas absorbed, the sludge dries very rapidly, and can be disposed of on a very small area of ground. Most important of all is the freedom from odor of the plant as a whole, which is in marked contrast with the offensive conditions that generally surround the ordinary septic tank installation. The gases liberated from the Atlanta

tanks are composed of nitrogen, carbon dioxide, hydrogen, and methane, and burn freely, producing an average of 700 B. T. U. At this plant, this gas is being used for all purposes in the laboratory and for cooking and heating in the chemist's residence. Mr. Hammon, the resident chemist at the Atlanta plants, estimates the gas production to be at the rate of 3,750 cu. ft. per million gallons of sewage treated. In this county of high-priced fuel, this gas alone might prove to be an item of considerable value, if properly conserved.

A few days after visiting the Baltimore plant in October, 1913, the writer visited the Atlanta plants. Things here were quite different from those observed at the former plant. There was no disagreeable odor, no worms or flies, and sludge which had been on the drying bed one week was dry enough to be removed, and a portion of it was taken up, wrapped in a newspaper, and brought to Austin in the writer's suit case, and has been preserved and is exhibited here today. While this specimen is now more than three years old, and is slightly dryer than when it was taken from the drying bed, it was no more offensive at that time than it is today.

B129-817-1m

University of Texas Bulletin

No. 1735: June 20, 1917

ROADS AND PAVEMENTS

Published by the University six times a month and entered as second-class matter at the postoffice at
AUSTIN, TEXAS

The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston

Cultivated mind is the guardian genius of democracy. . . . It is the only dictator that freemen acknowledge and the only security that freemen desire.

Mirabeau B. Lamar

INTRODUCTION

On February 13-15, 1917, a meeting was held at the University of Texas, under the auspices of the Engineering Department, for all engineers interested in municipal work. There is at present no organization of civil engineers in Texas which devotes any considerable part of its time to city engineering problems. This meeting was held because it was thought that there was a real need for an organization in this line of work, and the response from engineers over the state was very gratifying. It is intended that a similar meeting shall be held at the University of Texas each year, and all city engineers, their assistants, and others interested in road construction, sanitary design and construction, and the various other branches of municipal work, are most cordially invited to attend. Engineers are also invited and urged to present papers or discussions on any line of municipal engineering upon which they have been engaged or in which they are particularly interested. Requests for papers on particular lines of work, if sent in early enough, will be turned over to experts engaged in the line of work desired, and their discussion invited.

Ample time will be given to discussion of papers presented, as there is probably greater benefit derived therefrom for the indivdual members than from the reading of the papers themselves.

Some little confusion, due to class schedules, was noticeable during the meeting, but arrangements in this respect will be perfected. The following papers on various subjects connected with roads and pavements were presented at the February meeting, and are issued here in bulletin form for the advantage of those who could not make arrangements to attend.

R. G. T.

CONTENTS

Page

Concrete Roads 5
By A. W. Bowles, Texas Portland Cement Association

Asphalts and Tars in Surface Treatments..... 22
By R. G. Tyler, Adjunct Professor of Highway and Sanitary Engineering, University of Texas

Penetration Bituminous Pavements..... 35
By R. G. Tyler, Adjunct Professor of Highway and Sanitary Engineering, University of Texas

A Discussion of Road Materials..... 40
By J. P. Nash, Testing Engineer, Bureau of Economic Geology and Technology, University of Texas

CONCRETE ROADS: CONSTRUCTION AND MAINTENANCE

By A. W. Bowles, Texas Portland Cement Association

[*Synopsis:* A discussion in detail of the problems entering into the design, construction, and maintenance of concrete road surfaces. Necessity for proper drainage, factors determining thickness, proportions, and crown of road surface, each step in the construction of the pavement, and the methods of patching defective pavement, together with other maintenance problems, taken up, showing the latest practice in each field.]

Mr. Chairman and Gentlemen: It was with somewhat of a shock, on starting this paper, which is to cover *Concrete Roads: Construction and Maintenance,* that I realized I had been assigned a subject which, when discussed at the last National Conference on Concrete Road Building, was carefully covered by more than seventeen committees made up of engineers and others of national ability and reputation. However, I appreciate and wish to thank Mr. Taylor, who arranged this program, for the opportunity of helping to this little extent to further the practice of permanent highway construction.

The subject as assigned may rightfully be divided into two distinct and independent headings:

I. The Construction of Concrete Roads.
II. The Maintenance of Concrete Roads.

I. The Construction of Concrete Roads

Considering the construction of any highway, whether it is a system or not, the engineer first views his problem in a broad sense, and I believe the construction of concrete roads should be approached in just such a manner. To accomplish this end, I have subdivided the first heading as follows:

1. Design.
2. Construction.

1. *Design.*

The problem of the design of a concrete roadway resolves itself into the drawing up of plans and specifications to fit local problems and conditions, which exist in each and every case. It is too often the case that the engineer selects the first copy of specifications at hand, which more than likely have been prepared for circulation over the entire country, and which for this reason can not possibly fit local conditions.

In drawing up plans and specifications for a concrete road, street or alley, the engineer should consider the following:

(a) Materials.
(b) Grading.
(c) Drainage.
(d) Subgrade and sub-base.
(e) Forms.
(f) Pavement section.
(g) Joints.
(h) Measuring materials and mixing concrete.
(i) Reinforcing.
(j) Placing and finishing concrete.
(k) Protection of curing.
(l) Shoulders.

All these items should be covered in the specifications, which should be carefully written by the engineer to cover any condition which exists in the specific instance.

Considerable trouble and expense may result from the adoption of standard specifications verbatim. Extreme difficulty may be experienced in obtaining materials to comply with the specifications, when some slight change would allow the use of local material and still obtain excellent results.

(a) *Materials or Aggregates for Concrete Roads.*

The fact that the finished surface must withstand three destructive agencies, traffic, weather, and structural stresses, makes it necessary that the very best materials be used. It is hard to distinguish between the effects of traffic and weather.

Experience has proven that the life of a concrete roadway,

in the face of these destructive agencies, depends upon the qualities of the aggregates. These qualities are:

(1) Durability of the particles.

(2) Grading of these materials.

(3) Cleanness of these materials.

(4) Chemical and mineralogical composition of the materials.

Aggregates for this type of construction are of two sizes:

Coarse aggregate, which by practical experience should range in size from ¼ inch to 1½ inches.

Fine aggregate, graded in size from ¼ inch down, with a limited amount of the finest particles.

Materials used successfully as coarse aggregates are:

Crushed rock (hard limestone has given best results).

Gravel or crushed gravel.

Slag.

As fine aggregates:

Natural bank sand and rock screenings, but from a construction standpoint it is advisable when using screenings to specify half sand, which will give a much easier finished concrete.

Generally, materials of such quality must be chosen and the proportions so made that uniform wearing will result. Local conditions in this regard lead to the adoption by the engineer of either the one or two course type of pavement.

Grading of these materials should be such that construction will not be hampered and the densest and most durable concrete will result.

To serve satisfactorily as aggregates in this construction, all materials must be practically free from clay, loam, mica, or other materials which have proved detrimental in concrete. Not only the amount but the way in which this foreign matter occurs proves the controlling factor. Coating around the aggregates, even in small percentages, may prove detrimental to the bond, and should be considered. It has been proved by practice that pit-run or crusher-run materials can not be used satisfactorily in this type of construction.

The chemical and mineralogical composition of the aggregates quite often affects the wearing quality of the finished roadway. One can readily realize that the structure of the aggregates

affects the road surface in so far as its resistance to wear and weather.

These conditions call for a careful study of the aggregates available prior to drawing up the specifications, to insure that only the most adaptable for this type of construction be used.

(b) *Grading.*

Grading is similar to that in other types of road work. More care should be exercised, in order to obtain as compact a grade as is possible on which to construct a monolithic surface.

(c) *Drainage.*

The drainage problems in any highway construction may be divided into three classes: (1) Disposal of surface water. (2) Disposal of rainfall on the road itself. (3) Underground drainage.

The first two problems are handled by the construction of side ditches, with a suitable crown to the road surface to insure drainage from the surface.

In communities where excessive climatic conditions are experienced and the ground freezes to some extent, it is very important that moisture be drained off to a level considerably below the base of the concrete.

We believe this is also true in soils which have a tendency to swell and shrink with an increase or decrease in moisture content. Both frost action in the sub-base and the movement with swelling and shrinking will cause heaving and settlement and subsequent cracking of the monolithic surface.

Underground drainage has been accomplished in two different ways: First, by raising the roadway; and, second, by installing a system of sub-surface drainage.

Engineers in this section up to the present time have met the drainage problem by the construction of fills and side ditches to care for all surface water. This has one disadvantage, and one especially bad in the black-land section of this state, in that the fills constructed to a depth of two feet or more show considerable settlement for at least six months to a year after construction. This makes it dangerous to construct hard and monolithic surface roads on them.

(d) *Subgrade and Sub-base.*

Subgrades for a concrete roadway are built on three cross sections, all three of which have their advocates and good points, and are used in either one place or another.

(1) Crowned subgrade (either parallel to the road surface or less than the crown of the road).

(2) Flat subgrade.

(3) Dished subgrade.

Crowned subgrades are advocated for all pavements more than 20 feet in width, necessitating the construction of a greater thickness of concrete at the center than at the sides.

Dished subgrades are used universally in the construction of concrete alleys, and to some extent for roadways. This type diminishes the tensile stresses thrown in the concrete.

The preparation of either type consists in grading, leveling, and rolling, to insure a firm and unyielding base or foundation.

(e) *Forms.*

The specifications should be drawn to insure a straight line and uniform grade. If a large amount of work is contemplated under the specifications, it appears advisable to specify the use of steel or steel-capped forms.

(f) *Pavement Section (Widths and Thickness).*

Traffic conditions determine the width of any roadway, and a careful and thorough traffic census and a considerable study into the probable growth of the community should be made before either

The single track (8 to 10 feet wide),

The double track (14 to 18 feet wide), or

A wider roadway (22 to 30 feet) is decided upon.

There seems to be a considerable field for the single track road throughout this section, especially where adequate shoulders are constructed. The narrow hard surface will carry the larger percentage of the heavy loaded traffic, and shoulders

constructed under these conditions will stand for a considerable length of time.

The proper thickness depends more or less upon

Climate,
Width of slab,
Type of pavement (whether reinforced or not),
Character of soil,
Thoroughness of surface and subdrainage,
Degree of consolidation of subgrade,
Proportions and quality of concrete,
Character of workmanship,
Care in curing,
Character of traffic.

Of course, these factors are not of equal importance, and their importance depends upon the locality.

The thickness of the slab for this reason can best be determined by a study of the practice throughout the country on successful and unsuccessful work. A short summary of these may prove of interest.

(1) *California:* Semi-arid and arid climate. A four-inch thickness has been used with success.

(2) *Oregon.* Semi-arid. Five and one-half inches to 6½ inches seems most successful.

(3) *Mississippi Valley:* Six inches at the sides and 7 inches to 8 inches at the center.

(4) *New York:* Six inches at the sides and 8 inches at the center is recommended after trying many experiments.

(5) *Texas:* Four inches to 6 inches at the sides and 6 inches to 8 inches at the center is recommended throughout the central section of the state.

There seems to be a distinction between practice for country roadways and city streets with respect to the recommended crown. One twenty-fourth to 1/200 of the width has proven sufficient for country roadway, while 1/50 to 1/200 is satisfactory to insure against water and rubbish remaining on the surface of city streets.

It is an advantage that, with the slight crown necessary on a concrete road, the tendency to distribute traffic over the en-

tire surface is increased and the wear on the surface distributed so that the life of the roadway is prolonged. A similar advantage can be cited for city streets.

I might mention the matter of limiting grades on which a concrete road or pavement would be serviceable. The limiting grade is dependent to a great extent on climatic conditions, the character of traffic, and the finish of the surface.

In humid climates, frost or ice may limit the grade to 7 and 8 per cent, while in arid climates up to 10 and 12 per cent will in most cases prove satisfactory for all types of traffic.

(g) *Joints.*

To quote from the report of the committee on expansion and contraction in concrete roads, which condition causes transverse and to some extent longitudinal cracking of the road surface, the following conclusions may reasonably be drawn from the foregoing:

"That contraction and expansion are caused both by temperature changes and by changes in moisture conditions, and that under climatic conditions similar to those at Washington, D. C., the effects from these two factors in concrete road surfaces are approximately of the same magnitude.

"That in concrete roads, contraction and expansion are sufficient to cause frequent transverse cracks, unless joints are provided. That the actual movement in any particular case depends upon the character of the concrete and of the subgrade. A sloppy concrete shows greater movement than a concrete mixed only moderately wet. No more water should be used than is necessary to permit of convenient placing and forming."

Practice has proven that joints placed in concrete roads at the time of construction will diminish the maintenance expense necessary. It is at present the recommended practice that joints, to be of maximum effect, should be spaced as follows: Roads, 25 to 50 foot spacing, varying directly with the width, except where reinforcing is used, where a 50 foot spacing is allowable.

Streets, where wider sections are used: Twenty-five foot spacing is recommended.

The specified thickness of the filler necessary is greater in

unreinforced roads, where a ¼ inch filler is recommended, than in reinforced roads, where ⅛ inch filler is sufficient.

Two types of joints have been successful: the protected and the non-protected joint. Engineers differ in regard to the advisability of protecting the edges of the concrete adjacent to the filler with steel plates. The unprotected joint as used today is made by installing at the time of construction the specified thickness of prepared fiber matrix ½ to 1 inch wider than the thickness of the concrete.

(h) *Measuring Materials and Mixing Concrete.*

Fairness to the contractor demands that we cover completely in the specifications the details which he is expected to follow while measuring and mixing concrete.

The proportions of cement, sand, and stone for concrete roads are dependent upon the class of materials and upon the type of pavement to be laid, whether one or two course.

The one course type of pavement is to be recommended where materials satisfactory for its construction are to be found. However, material conditions may make it economical to adopt the two course pavement, which becomes the case where a local material suitable for a concrete base, but not satisfactory from a wearing surface standpoint, is to be had at low cost.

In such a case a sufficient quanity of hard, suitable stone can be shipped in to construct the wearing course.

The recommended proportions and thickness for one course and two course roads and pavements are:

One Course:

Six inches thick, of the proportions one part cement, two parts sand, and three parts stone.

Two Course:

Base, 5 inches thick, of the proportions one part cement, two and one-half parts sand, and five parts stone.

Top, 2 inches thick, of the proportions one part cement, one and one-half parts sand, and two and one-half parts stone.

However, these proportions should be determined only after careful and scientific study of the aggregates, and in numerous cases may be changed from the proportions mentioned above.

In order to obtain a uniform wearing surface, we must have uniform proportioning of materials, and to accomplish this the use of measuring boxes is recommended. The use of these should in no way hamper the progress of the work.

Engineers are universally agreed that satisfactory results can only be obtained by the use of a batch mixer. It is advisable to specify the duration of mixing, and practice has demonstrated that stronger and more durable concrete will result if a minute to a minute and a half mix is specified, with the minimum number of revolutions of the mixer specified.

It is further to be recommended that a method of delivery be specified which will make the use of horse drawn or push carts expensive and impracticable.

(i) *Reinforcing.*

Reinforcing is advisable for three reasons: to care for heaving (due to frost action or alternate wetting and drying of the sub-base); to bridge over soft spots or settlements in the base; to resist the shrinkage of the pavement (due to moisture content or temperature changes).

The use of reinforcing will decrease the number of joints necessary, which have proven the greatest disadvantage to concrete roads, and will also reduce to a minimum the maintenance cost.

Reinforcing should be placed three inches below the finished surface, and the amount should vary with the width as follows:

Width of Road	Reinforcing per Foot Length	Reinforcing per Foot Width
16 feet	0.090 sq. in.	0.030 sq. in.
20 "	0.100 "	0.030 "
30 "	0.120 "	0.030 "

(j) *Placing and Finishing Concrete.*

The methods of placing and finishing concrete have been determined by practice, and should be covered in the specifications to guarantee satisfactory work. Methods should be used to allow finishing of the roadway with as little handling and working of the concrete as is possible after leaving the mixer.

Finishing should be accomplished with a wood float just prior to the time of initial set, which will relieve surface tension and diminish surface checking.

(k) *Protection of Curing.*

Protection of the concrete from the sun's heat in summer and also from dry winds is necessary to allow complete satisfactory setting and to eliminate drying out of the surface. Protection by canvas coverings should be specified when necessary.

When sufficiently hardened, concrete should be covered with dirt 2 to 3 inches thick, and kept wet for a period of ten days to two weeks.

(l) *Shoulders.*

Shoulder work is of great importance on single track roadway, where it will be called upon to withstand wear and traffic. Shoulders for single track roads should be constructed of either gravel or crushed rock of sufficient width to allow the passage of two teams. Shoulders for other widths of roadway should be constructed of suitable material and of such cross section to guarantee satisfactory surface drainage.

In this discussion I hope I have brought out the important facts which should be covered in the specifications, and that I have made it clear why each should be considered separately, due consideration being given to both local conditions and the experience on similar work throughout the country.

2. *Construction.*

The construction of a concrete roadway is most easily discussed as a general subject, describing briefly the modern methods followed. However, a division can conveniently be made.

(1) Drainage and preparation of subgrade.
(2) Handling of materials:
    (a) Sand and stone.
    (b) Cement.
    (c) Water.

(3) Forms: handling and placing:
  (a) Setting.
  (b) Removing and curing.
(4) Mixing, placing, and finishing:
  (a) Organization of crews.
  (b) Construction:
    (1) Handling materials.
    (2) Concreting.
    (3) Finishing.
    (4) Curing.
    (5) Shoulder construction.
(5) Engineering and inspection.

(1) *Drainage and Preparation of Subgrade.*

For streets, as well as roads, tile drains may be used. These should be laid on each side of the roadway, or may be laid on one side only, with cross drains leading thereto at a suitable depth, depending on the width of the pavement. Drainage trenches, if placed under the subgrade, should be completed before final rolling.

Grading

When roadways are constructed over fills, extreme care should be observed to insure the use of proper materials, in layers of such thickness that the fill may be thoroughly compacted with minimum settlement. In general, fills shall be made in thin layers; the fills should be allowed to stand as long as possible. Deep fills should be allowed to settle through one winter, if such procedure is possible. Wetting and rolling should always be resorted to.

The subgrade should be of uniform density, so that it will settle evenly. An old roadbed should be scarified, reshaped, and rolled. All subgrades adjacent to the curb should be hand tamped. The sub-base should be wet prior to laying concrete.

(2) *Handling of Materials.*

Four methods of handling materials are used, the economy of each depending upon the locality and the length of the haul:

First, wagon and team haul; second, auto trucking; third, traction engine and trailers; fourth, industrial railroads.

The controlling essential is that the method of hauling shall provide sufficient material to allow uninterrupted movement of the construction gang at the mixer.

Team and auto haul are adaptable to conditions where good roads already prevail. The economy of this method is questionable where more than a two-mile haul is experienced.

Industrial railways are adaptable where long stretches are to be built, with an average haul of more than two miles. This method allows easy distribution of materials.

In sorting materials, it has proven economical, where the use of a traction type of mixer is adopted, to deposit the materials in piles along the prepared subgrade. This method is to be encouraged. Methods necessitating the use of horse-drawn or hand-pushed carts are to be condemned, since it leads to interruption of the work, cutting up of the subgrade, and the segregation of aggregates in the concrete. Sufficient material should be spotted on any job to allow the mixing and placing to continue a considerable period of time, as weather conditions may make hauling impossible when construction could continue.

In the handling of cement, such arrangements must be made to protect it from the elements. Where a traction type of mixer is used, cement must be spotted at intervals of not more than 50 to 100 feet. To protect these piles, it is customary to erect small canvas houses or tents. These are easily moved forward as the cement is used. Cement should always be piled on platforms, raised from two to six inches above the ground.

The water supply, in many instances, becomes a serious problem for engineers and contractors. In both city and county work, this should be handled by the construction of a pipe line running parallel to the road or street and back two to four feet from the edge. T's should be placed with control cocks at intervals of every 100 to 200 feet. The supply is easily carried to the mixer by a hose line, and also easily supplied for curing in a similar manner.

(3) *Forms.*

Forms should be handled in such manner as will reduce the

expense connected with this item as much as possible. This calls for the adoption of a type of form which will reduce the repair and replace item as much as possible.

For a large amount of roadwork, which calls for considerable handling of the forms, the use of steel forms will prove most economical. Two by six wood steel capped forms will also prove satisfactory. The steel capping should extend over one end of the 2x6, to faciliatate placing the form on line and grade.

Separate gangs should be organized for setting and removing and cleaning forms. All forms should be cleaned when removed, and steel forms should be oiled at such intervals of time as to insure against excessive depreciation. Wooden forms should be piled flat, to prevent warping.

Two men are sufficient to set forms sufficiently in advance for concreting gangs. The curing gang may satisfactorily be used in removing and cleaning the forms.

(4) *Mixing, Placing, and Finishing.*

The organization of a concreting crew should take into account the size and type of the mixer and also the type of the work to be done, whether street or road work. For county roadwork, with a two-sack batch capacity mixer and standard specifications, 26 men can be used satisfactorily on the construction.

2 men handling cement.
2 men wheeling sand.
2 men loading sand.
3 men wheeling stone.
3 men shoveling stone.
1 man at mixer.
2 men grading subgrade.
2 men leveling concrete.
2 men on template.
1 finisher.
3 men curing.
1 engineer.
1 fireman.
1 foreman.

The organization of the crew should be worked out carefully and be such that the maximum capacity of the mixer will be obtained, allowing the specified time for mixing.

In construction, it will be found economical to use loaders separate from wheelers. With this arrangement, the use of

measuring boxes, to obtain accurate proportions, will not prove any drawback to the progress of the work.

The size of the crew necessary for the proper distribution of concrete depends upon the type of delivery connected with the mixer. With boom and bucket or chute mixer, one man is needed to handle the chute and two for distributing the concrete.

Finishing

The finishing gang in concrete road construction consists of two men handling the template, or strike-board, and the number necessary properly to float and finish the work. The strike-board should be constructed of such length and dimensions as can be easily handled. On roadways 20 feet and less in width 3 in. by 10 in. stock is usually used; for the narrower widths, two 2x10's are usually bolted together and crowned as specified for the crown of the road.

The concrete, after being leveled off to approximate grade, should be struck off with a template, or strike-board. Finishing should be done after the surface water has drained off.

A number of methods of finishing are in use.

(1) By floating with long handled floats from the side of the roadway.

(2) By hand floats from bridge, no part of which touches the surface.

(3) By the use of leather, canvas, or wood strips.

The last two methods are to be recommended, the strip being cheaper and easier to handle. It is, however, necessary to use the hand float from a bridge to work out rough and uneven spots in the surface where the strip method is adopted.

Curing

In hot, dry weather, canvas protection should be given the surface after finishing and until it is sufficiently set to allow sprinkling and subsequent covering with sand, dirt, or loam of such character as will hold moisture. This should remain wet for a period of ten days or two weeks, depending on weather

conditions, and should not be opened to traffic until allowed subsequently to dry out.

Other methods of curing should be adopted when weather conditions demand. Where a uniform temperature under 60° and above 34° exists, the surface need not be covered, but it is advisable to sprinkle when the temperature rises.

When a freezing temperature is experienced, arrangements should be made to protect the concrete from freezing. It is advisable to discontinue concreting if a freezing temperature is to be encountered.

Shoulders

The shoulders should be constructed after the surface has been cured and prior to opening the road to traffic. The shoulders should be placed and rolled, care being taken to keep the roller off the edge of the concrete.

(5) *Engineering and Inspection.*

Engineering and inspection connected with the construction should be planned to obtain uniform work in accordance with the specifications. All sub-base should be checked by the engineer in charge before materals are spotted, and all materials should be accepted before hauling on the work.

It should be the duty of the inspector to check up the materials, including the cement, on every section, and to watch carefully the time of mix used at all times throughout the work.

II. The Maintenance of Concrete Roads

Concrete roads, like all other types of pavement, if they are to give their maximum service, must be properly maintained. The small amount of work and small expense necessary to maintain a well built concrete road in perfect repair should not be made an excuse for delaying the work, but rather an incentive to have it done immediately.

Maintenance should be systematic, and imperfections given immediate attention.

Cracks.—Cracks in concrete roads occasion no inconvenience whatever to traffic, and traffic will not injure the road at

such a place if the crack is filled with tar and covered with sand. The crack should be first cleaned with a stiff wire broom, and all loose particles of material removed. If the crack is too narrow to permit cleaning in this manner, it may be cleaned with an air jet from an automobile pump. Tar should then be poured into the crack in sufficient quantity just to flush over the edges, and afterwards covered with coarse dry sand.

Tar.—Refined coal tar should be used, having a melting point (half inch cube method in water) of about 100 degrees Fahrenheit. The tar should be heated from 225 to 250 degrees Fahrenheit at the time of application, and may be applied by means of a sprinkling can, with spray nozzle removed. Sand or screenings, thoroughly dried, graded from ⅛ to ¼ inch, should be spread over the surface before the tar has cooled.

Small Holes.—Where a small hole occurs, due to the displacement of a lump of clay or a piece of coal or wood, it should be thoroughly cleaned, and filled with tar and stone chips. If the hole is 2 or 3 inches in size, it should first be wiped with the tar, and stone chips put in; these are covered with more tar and sand, and tamped into place.

Slight Depressions.—If, for any cause, the surface of the concrete has scaled and a slight depression formed, it can be coated with tar, stone chips added, these in turn covered with tar, and the whole covered with sand and tamped into place.

Deep Holes.—If, through neglect or other causes, a hole of any considerable size and depth has formed in the surface of a concrete road, the concrete surrounding the edge should be cut away until the walls are made practically vertical, and cut to a depth of at least 3 inches, or as much deeper as the hole may be. The hole should then be filled with water, and stand for a few hours, after which the water should be removed, the sides washed with cement paste, and the hole filled with concrete of as nearly the same materials and mixture as that in the original road. The surface should be finished with a wood float, and brought to a true shape with the surrounding surface of the concrete, then covered so as to protect it from traffic. This may be done by the use of steel plates or pieces of plank, which should in turn be covered with moist earth or

gravel. This will permit the traffic to use the repaired portion of the road without injuring the concrete. On a wide street, where there is sufficient room, a barrel could be placed over the hole and traffic diverted around it.

If it is necessary to cut a hole through the entire thickness of the concrete slab, gravel should be placed in the sub-base and thoroughly rammed, so as to form a compacted base on which the new concrete will rest. Where water has been allowed to stand in such a place, it should be compacted after the water has been removed and just before laying the concrete.

The consistency of the concrete should be sufficiently stiff to require considerable tamping to bring water to the surface, so that it may be possible to ram it thoroughly into place.

A new patch should be kept moist for at least 4 or 5 days, and protected from traffic at least 10 days.

Conclusion

Owing to the increase of population, the travel upon rural and suburban roads and city streets has increased rapidly in recent years; and this increase in travel, together with the introduction of the automobile, has necessitated the development of a new type of road surface.

The concrete road is admirably adapted to meet present-day traffic conditions. Concrete roads are moderate in first cost, low in maintenance, smooth, hard, dustless, sanitary, easily cleaned, and not slippery. They are suitable, first, for country highways, for roads subjected to overflow, on hills where the macadam road surface may be washed away more rapidly than worn away; and, second, for pavements in small cities, for outlying streets of larger cities, and especially for all streets where curbs are not required.

ASPHALTS AND TARS IN SURFACE TREATMENT

By R. G. Tyler, Adjunct Professor of Highway and Sanitary Engineering, University of Texas

[*Synopsis:* A discussion of the use of asphalts and tars in surface applications on earth, gravel, macadam, and concrete roads surfaces. With earth roads, this treatment only to be considered as a maintenance proposition. Waterproofs and settles the dust. Gravel not so satisfactory a foundation for this surface mat as macadam. On gravel, satisfactory as maintenance proposition. On macadam, good permanent construction. Advantages and disadvantages of asphalt and refined tars discussed. Thin surface treatment on concrete roads described. California practice discussed.]

During the last few years, the use of asphalt and tars in surface treatments of roads constructed of various materials has received considerable study, and has had the attention of investigators and experimenters in various parts of this country.

California has led in this phase of bituminous construction, due to the abundant, and therefore cheaper, supply of asphalt and an ideal climate, from the road-builder's standpoint. Bituminous treatments have been given practically every type of road, with varying degrees of success. For convenience, in this paper, the bituminous materials used will be discussed under the headings of the type of road treated, i. e., treatment for earth roads, treatment for gravel and macadam roads, and treatment for concrete pavements.

Treatment for Earth Roads

From time to time, the opinion has been advanced that bitumen as a binder was a panacea for all ills, that it could be mixed in proper proportions with any material whatever, and used to make a durable road surface. So types of pavement were developed whereby earth was mixed with bituminous material, and shaped into a road surface. This has not been successful, however, and experience has shown that permanent construction can not be obtained by the use of asphalts or tars on earth roads. The reason for this is readily apparent. The

bitumen is a binder, and, to form a satisfactory road surface, it must bond together a material that has distinctive wearing qualities. This quality is lacking in ordinary soil, and a road surface built of these materials will not have the requisite stability. It should be remembered, therefore, that the use of oils on earth roads, whether mixed or applied as a surface treatment only, is a maintenance proposition strictly. The proper use of a suitable material will, however, serve as a dust palliative, and will also form an impervious surface, which will prevent the road cutting up into mud, except in periods of prolonged rains.

A street carrying heavy traffic should not be oiled, as oiled earth road surfaces have not the necessary stability to carry heavy traffic. But, on many of the streets in the residential sections of a city, oiling is a justifiable procedure. A proper treatment with oil will render these streets practically dustless, and make them so they can be used at all times throughout the year.

Athough so much has been written and said on the method of preparing street surfaces for treatment, the importance of so doing can not be over emphasized, and a few words here will not be amiss.

The street should be graded and brought to the proper cross-section. The drainage must be taken care of, as oiling will not improve a mudhole, and a poorly drained street may be worse after oiling than before. It is necessary also that the surface to be treated be free from dust, or the oil will not penetrate into the surface. To insure this condition of freedom of dust, it is well to give the road a light sprinkling immediately before the oil is applied. Care should be taken not to use too much water on the road, as too much is as objectionable as the dust.

The oil is then applied, either by hand or preferably from a pressure distributor, at a rate of from ¼ to ½ gallon per square yard. The first time the road is oiled, ½ gallon will probably be needed, but for subsequent treatments ¼ gallon per square yard will suffice. Only so much oil should be used as the road will readily take up, as, if more than this amount is used, it

will run off the street and be wasted, or will stand in puddles and be very disagreeable to traffic. The oil should be uniformly distributed, and several light treatments are better than a single heavy application of an equal amount.

The material ordinarily used is a light oil that may be applied cold. Paraffin oils are not so desirable as semi-asphaltic products. A 40 per cent to 60 per cent asphaltic oil is probably best for this purpose, especially for initial treatments. Later applications may be made with a heavier oil to good advantage. The use of the heavier material for first treatment would not permit of obtaining the desired depth of penetration, but would form a surface mat which would easily cut through and be very unsatisfactory.

The cost of applying the oil is about 1 cent to 2 cents per gallon. An oil conforming to the following specifications will probably be found to give satisfactory results with proper manipulation.

Specifications No. 1*

Light Oils for Surface Treatment of Earth Roads

(Cold Application)

1. The oil shall be a fluid product free from water.

2. *Specific Gravity.*—Its specific gravity at 25° C. (77° F.) shall not be less than 0.910.

3. *Total Bitumen.*—It shall be soluble in chemically pure cold carbon disulphide to the extent of at least 99.5 per cent.

4. *Naphtha Insoluble Bitumen.*—Of the total bitumen, not less than 1.5 shall be insoluble in 36° B. paraffin naphtha at air temperature.

5. *Fixed Carbon.*—The fixed carbon shall not be less than 2.5 per cent.

6. *Viscosity.*—When 240 cc. of the oil are heated in an Engler Viscosimeter to 50° C. (122° F.) and maintained at this temperature for five minutes, the first 50 cc. which flow through

*Bulletin No. 6, *Dust Prevention*, by Frank L. Roman, Testing Engineer, Illinois Highway Department.

the aperture shall show a specific viscosity of not less than 5 nor more than 15.

7. *Loss on Evaporation.*—When 20 grams of the oil (in a tin dish 2½ inches in diameter and ¾ inch deep with vertical sides) are maintained at a temperature of 163° C. (325° F.) for five hours in a N. Y. Testing Laboratory oven, the loss shall not exceed 25 per cent by weight.

Treatment for Gravel and Macadam Roads

With the advent of motor vehicles, the wear on gravel and macadam roads has become so excessive that the life of this type of pavement is considerably shortened, and it has become a practical necessity to provide some kind of bituminous surface treatment to resist the dusting up and blowing away of the finer surface materials.

There is a considerable difference of opinion among engineers as to the value of a surface treatment for gravel roads. Some roads which have received such treatments have shown satisfactory results, while others given apparently the same treatment have not been successful. As a maintenance proposition, to prevent the dusting up of a road by auto traffic and the wasting of the finer materials by wind and rain, there can be no question as to the economy of such a treatment. The large mileage of gravel roads which have received either hot or cold asphalt and tar surface treatments in Texas during the past two or three years will do much toward proving or disproving the permanence of this type of road construction.

With macadam roads, the case is different. The experience both here and in the East has been that an application of a suitable bituminous material to a well prepared macadam road surface will yield a mat that should last for several years. Here, as in the case of the gravel road, the results obtained depend both on the kind of material used and on a proper attention to detail in its application.

The preparation of the street surface, whether gravel or macadam, is of prime importance. A depression or irregularity left in the street surface at this time will be hard to remedy after the bitumen is applied. Not only must the surface be

brought to the proper cross-section, but it should be thoroughly compacted, either by the use of a steam roller, or by traffic. After being properly bonded together in this manner, all irregularities and depressions that occur should be remedied, and the entire surface brought to a true grade. Any depressions left will hold water, after rains or sprinkling of the pavement, and will be a detriment to the bituminous mat. The street should then be swept clean. It is better if the sweeping even removes some of the binder from the surface material, leaving the individual pebbles or particles of stone sticking up in such a way that the bitumen will have a better opportunity of obtaining a satisfactory bond. These pebbles projecting in this manner appreciably increase the surface exposed to contact with the bitumen, which obviously increases the tenacity with which the bituminous mat will adhere to the road surface. This cleaning of the surface must be thoroughly and carefully done, as upon it depends the bond of the surface mat to the road. Bitumen, whether cold or hot, can not stick to stones or pebbles which are covered with dust, since it can not come into intimate contact with their surfaces.

After the preparation of the street surface is complete, the bitumen may be applied, either by hand pouring pots or by pressure distributors. If the former method is used, it requires very great care to obtain a uniform application of the material. Perhaps the best method is for the man with the pouring pot to walk backward at a uniform rate, allowing the material to flow out on to the street surface without any swinging of the pot. It is much better, however, if the size of the job will permit, to apply the bitumen, whether hot or cold, with a pressure distributor, as a more uniform treatment can be secured by this means. Care should be taken to avoid an overlapping of treated surfaces at successive passages of the distributor, as "fat" places will be formed, which are objectionable.

The amount of bitumen to be used varies from ¼ to ½ gallon per square yard, depending upon the amount that the street surface will absorb. Where the heavier treatment is used, it is preferably applied in two equal treatments. After the bitumen is applied, enough coarse sand or screenings, from

which the dust has been removed, is spread upon the street to absorb any surplus material which the roadway will not. Ample time should elapse before the sanding of the street to allow the bitumen to obtain a maximum penetration into the material of the roadway.

There has been considerable difference in practice as to the kind of material to use in this surface treatment. For first treatment, the heavier materials seem to give very satisfactory results. These materials are usually applied at a temperature of from 250° to 350° F. Some engineers, however, claim that they obtain better results with cold oils, which includes all asphaltic materials having a specific gravity of about 0.98 or less. Asphalt oils having a specific gravity as low as 0.95 may require heating if used in cold weather. For a tar, for cold application, the maximum specific gravity is about 1.22. In either case, for initial treatment, the cover material should preferably be of an amount sufficient to build up a mat from ¼ inch to ⅜ inch in thickness. A coarse clean sand is desirable, while a good grade of stone screenings, with the dust screened out, probably gives better results. Very often, however, the fine material which has been swept from the road is used for this purpose. Unless too large a per cent of loam is present, fairly satisfactory results may be obtained, though not so good as with the coarser materials. The advantage of the coarse material lies in its wearing qualities and greater stability, while the only points that can be urged for the finer material are its cheapness and the increased surface area which it presents to the bitumen for adhesion. This last item probably explains the good results sometimes obtained by the use of finer materials, as against the generally accepted preference for the coarser cover materials. Colloidal chemistry has not until quite recently received the attention and study that it undoubtedly deserves. A given liquid has a certain amount of surface energy, which is the energy exerted by a contact of the liquid film with a solid surface. One gram of sand of such a size as just to pass the 10 mesh sieve would have a surface area of 15 square centimeters, while the same amount of sand fine enough just to pass a 200 mesh sieve would have a surface

area of 283 square centimeters. It is upon this surface tension between liquid films and this increased surface area of extremely fine particles that the theory of the sheet asphalt pavement is based. Mr. Clifford Richardson gives an able discussion of this subject in a recent paper delivered before the Western Society of Engineers.

For retreatment of street surfaces, however, the engineer is confronted by a somewhat different problem. Here the light oils are probably preferable. Where the street to be treated already has more or less of a mat on the surface from previous treatments, the function of the retreatment is not to build up an additional thickness of this mat, but to give new life to the bitumen in the old surface. The lighter oils flux the old material perhaps better than those which are heavier. It is doubtless better, also, to use less cover material in retreatment of surfaces than in initial treatments, for the two reasons above set forth.

It should be remembered that a surface treatment gives a mat which is not of itself stable. It is necessary, therefore, that this mat be not permitted to become thicker than about ½ inch, as it is likely to push and roll under traffic. This will influence the choice of oil to be used, whether heavy or light, and the amount of cover material to be applied.

The following specifications are representative of the asphaltic oils used in this work, both for the cold and for the hot treatment.

Specifications No. 2*

Medium Oil for Surface Treatment of Bituminous or Water-bound Macadam

(Should be applied hot when air temperature is below 80° F.)

1. The oil shall be a viscous fluid product, free from water.
2. *Specific Gravity.*—Its specific gravity at 25° C. (77° F.) shall not be less than 0.950.
3. *Total Bitumen.*—It shall be soluble in chemically pure cold carbon disulphide to the extent of at least 99.5 per cent.

*Bulletin No. 6, Illinois Highway Department.

4. *Naphtha Insoluble Bitumen.*—Of the total bitumen, not less than 5 nor more than 20 per cent shall be insoluble in 86° B. paraffin naphtha at air temperature.

5. *Fixed Carbon.*—The fixed carbon shall not be less than 4.0 nor more than 12.0 per cent.

6. *Viscosity.*—When 240 cc. of the oil are heated in an Engler Viscosimeter to 50° C. (122° F.) and maintained at this temperature for 5 minutes, the first 50 cc. which flow through the aperture shall show a specific viscosity of not less than 30 nor more than 70.

7. *Loss on Evaporation.*—When 20 grams of the oil (in a tin dish 2½ inches in diameter and ¾ inch deep with vertical sides) are maintained at a temperature of 163° C. (325° F.) for 5 hours in a N. Y. Testing Laboratory oven, the loss shall not exceed 25 per cent by weight.

8. *Flash Point.*—The flash point of the oil by the open cup method should not be less than 100° C. (212° F.).

Another debatable question here encountered is whether an asphaltic or semi-asphaltic oil or a tar is preferable. Refined tars such as are used in road work are made from a blending of tars obtained from many different sources and having a wide range of individual characteristics. The two main classifications of tars are water-gas tars and coal tars, the latter furnishing perhaps the bulk of the refined tar used in road construction. These two classes differ considerably in chemical and physical characteristics, and the individual groups making up these main classes also differ considerably. This variation is due to variations in process of manufacturing products of which the tars are by-products. Water-gas tars are not used for road purposes without mixing with some other bitumen. It is apparent, from the wide variety of materials used, that the manufacturer of a refined tar has many difficulties to overcome in producing a uniform product. It seems necessary, therefore, that the specifications for tar products should be very carefully drawn, and the materials as carefully tested, to insure obtaining the material specified. "The points generally covered in specifications are the specific gravity, viscosity or melting point, free carbon, and distillation. With distillation, it is also customary

in the best specifications to report the specific gravity of the distillate and the melting point of the remaining pitch. Some specifications also cover ash, the per cent of naphthaline, and freedom from water. The latter point is covered under distillation, and is superfluous. The ash is of minor importance. It is perhaps well to specify a maximum, to discourage attempts at adulteration. The specific gravity is of importance, as it shows to a certain extent the origin of the crude tars. It should not, however, be confused with viscosity, as the specific gravity and viscosity are only related when the tar serving as a base is the same in both cases.

"The viscosity or melting point is a very important point in refined tars, and must be very carefully specified. It has nothing to do with the origin or composition of the tar, since any tar may be brought to a given viscosity or melting point above certain lower limits. Free carbon has caused more discussion than any other item in the specifications. A large number of experiments carried on to determine this point (the effect of the amount of free carbon in the tar) have seemed to indicate that tars very low in free carbon are too much affected by temperature changes, and also are more subject to change under atmospheric influences than tars which contained a fair amount of free carbon."* Experience has borne out the results as shown by these experiments, and also seems to indicate that a certain percentage of free carbon enhances the binding value of the tar. From 12 to 25 per cent for a binder and from 10 to 22 per cent for a tar to be used in hot blankets are the limits of free carbon allowable. This amount should be reduced to about 4 per cent for materials used in cold applications, as a large amount of free carbon reduces the penetration.

The distillation limits are usually from 170° C. to 300° C. One of the principal advantages of tar over asphalt is that it appears to penetrate more readily into the road surface. This appears to be due to the fact that the viscosity of tar increases much more rapidly with a given rise in temperature than with

**Chemistry, Manufacture, Transportation, and Control Testing of Refined Coal Tars*, by Philip P. Sharples, Barrett Manufacturing Company, N. Y.

asphalt. For the same reason, tar may be more brittle in cold weather.

Some of the disadvantages are that it oxidizes under climatic influences more readily, and loses some of the more volatile fractions, which causes tar to lose its life more rapidly than asphalt, and for this reason requires treatment at more frequent intervals than the latter. It is more susceptible to changes of temperature, as above indicated, which is another disadvantage, and is injured more by overheating than are the asphalts.

For these reasons, if equal in first cost, an asphalt material is probably more satisfactory than a refined tar, and Eastern engineers are showing a preference for the asphaltic materials.

The following specifications represent the best practice in the use of tar for hot and cold applications.

Specifications No. 3

Refined Tars for Use in Road Blanket Treatments

Specific Gravity: Not less than 1.19 at 60° F.

Viscosity: Engler, 100 cc. at 100° C., 125 to 200 seconds. Or float test at 50° C., 35 to 60 seconds; or, at 32° C., not less than 2 nor more than 3 minutes.

Distillation: Method of American Society for Testing Materials. Nothing below 170° C., nor more than 24 per cent below 300° C.

Specific gravity of the tar distillate to be not less than 1.03 at 25° C.; residue from the distillation to be 75° C. (cube method in water).

Free Carbon: Not less than 10 per cent nor more than 20 per cent.

Specifications No. 4

Refined Tars Used in Cold Surface Treatments

Specific Gravity: Not less than 1.14 nor more than 1.18 at 15.5° C.

Viscosity: By Engler Viscosimeter, not less than 150 nor more than 300 seconds, for 100 cc. at 40° C.

Distillation: Method of American Society for Testing Ma-

terials, not more than 5 per cent below 170° C., nor more than 32 per cent below 300° C.

Specific gravity of the entire distillate shall not be less than 1.01 at 25° C.; residue from the distillation to have a melting point not greater than 70° C. (cube method in water).

Free Carbon: Not less than 4 per cent nor more than 12 per cent.

The usual method for obtaining the desired penetration with the heavier materials is to heat them until they are liquid enough to penetrate the road surface. When cooling, they harden again to their former consistency.

Another method has been used to some extent, with apparently good success; that is, to "cut back" the bitumen with a light volatile oil to the desired consistency for penetration purposes. The material is then applied, and the flux rapidly evaporates, and leaves the bitumen in the road. The flux is usually a naphtha or gasoline, and is easily mixed with the heavier base in the tank car by filling the tank with the desired amount of each and then pumping out at the top and in through a connection at the bottom until the materials are thoroughly mixed.

Usually about 35 to 40 per cent of flux is used. The following specifications represent the average practice.

SPECIFICATIONS*

Flux:

Beaume gravity, 53 to 60.
Flash, 35° F. (minimum) open cup.
End points of distillation 350° F.

Base:

Specific gravity, 77° F., 1.02 (minimum).
Penetration, 100 grams for 5 sec., at 77° F., 85 to 100.
Loss, 50 grams, 5 hrs., 325° F., not more than 3 per cent.
Soluble in carbon bisulphide, not less than 99 per cent.
Soluble in carbon tetrachloride, not less than 98½ per cent.
Ductility (Dow Method), at 77° F., not less than 45 cm.

*Headley Good Roads Company, Philadelphia, Pa.

The cut-back asphalt made from the combination of the above two products shall conform to the following tests:

Specific gravity, .900 (minimum).

Loss, 20 grams, 5 hrs., at 325° F., 35 to 40.

Penetration of residue, after heating for 5 hrs., 325° F., from 35 to 45.

Viscosity, 50 cc., at 77° F., in Engler Viscosimeter, 275 to 350.

The distillate off below 300° F. shall show a gravity of 53 to 60 sec.

Ductility of residue (Dow Method), not less than 30 cm.

Emulsions are made of bituminous materials by mixing with water, and are used in a similar way as the "cut-back." These mixtures are made either mechanically, which gives a very unstable mixture that must be used immediately, or by adding a small amount of alkali and cheap soap or saponifying material. This emulsion can then be readily mixed with water in any proportions. These materials have not been used extensively, and appear better suited to drives having only light pleasure traffic, as on park ways, etc.

Surface Treatment of Concrete Pavements

Bituminous surfacing or protecting coats have been used rather extensively in California on concrete pavements, and several patented pavements make use of this type of surface treatment. The principal reasons for its use are to do away with the glare of the concrete, to give a better footing to horses, to make a more resilient surface, and to prevent dusting and wear of the concrete. The conditions, both as to climate and as to materials, have been ideal in California, where this type of construction has been successful. Elsewhere, less enthusiasm is felt for this bituminous paint coat. In its application, about ¼ gallon per square yard is used, and covered with screenings or sand, as for gravel and macadam roads. The concrete surface shall be broomed until absolutely clean and free from dust and laitance. It is better to open the street to traffic for several weeks previous to treatment, in order to remove all laitance from the surface. Many failures have arisen from applying the bitumen

too soon. The oil used in California is an oil containing 90 per cent asphalt of 80 penetration.

The two physical requirements of greatest importance are that the oil must have a viscosity such that it can be easily applied and will allow the penetration of the stone screenings, and must be sticky, so that it will bind strongly to the concrete base and bond together the individual particles of the stone screenings forming the mat.

When properly applied, it appears that good results may be obtained. Up to the present time, however, as has been above stated, the experience outside California has not been all that could be desired.

PENETRATION BITUMINOUS PAVEMENTS

By R. G. Tyler, Adjunct Professor of Highway and Sanitary Engineering, University of Texas

[*Synopsis:* Tendency to use cheap labor on this pavement the cause of frequent failures. The success of this surface dependent to a great extent on attention to details in construction. Use of a single size of stone in preference to a well graded aggregate advocated. Cold patching methods described. Longevity of road surface dependent on keeping the surface mat intact. Tendency now to abandon guarantee and insist on carrying out of specifications, leaving the maintenance to the city forces.]

So many errors have been made in the construction of penetration bituminous pavements, and so many failures have resulted therefrom, that some engineers have become convinced that a satisfactory pavement can not be constructed in this manner; and, until the principles involved are thoroughly understood, failures will continue to result. Just because this pavement can be laid without the expensive plant needed for the mixed method of construction, it does not follow that any foreman who can handle laborers can lay a penetration pavement. Even more care is necessary in respect to the various details of construction with this pavement than with some other types. It is a fatal mistake to attempt any paving construction, except under the supervision of a competent engineer.

There are so many things to be said in favor of this type of construction that it is to be hoped that it will receive proper consideration from the engineers who contemplate street improvements. Especially is this true for the smaller towns. Contractors will bid on smaller contracts, since there is no expensive plant required. The unit cost of the pavement is less than for mixed pavements, in the majority of cases. Patch work can be done by the municipality more satisfactorily, and there is no very good reason why the community should not build its own pavements in the first place.

The object of this paper is not to tell something new and startling, but to review the best practice in penetration work,

and to call attention to some of the more important details, based upon work which has come under the speaker's experience and observation.

The same care must be given to securing a proper foundation, as is done for other pavements. The base course may be either macadam, gravel, or concrete. The first two are, of course, cheaper; and, since penetration macadam is used in order to secure a cheaper pavement, a macadam or gravel base is the logical one to be used.

The customary thickness of this base is from 4 inches to 6 inches. The thicker courses are usually laid in two layers, to facilitate rolling. Certain precautions need be observed in this operation. The material should never be dumped in rows from dump wagons and then spread with a grader or drag. Roads so constructed are quite sure to be wavy and uneven. When the material is dumped in this fashion, the finer stone works to the bottom of the pile, and, in spreading, only the larger sizes of stone are carried to the outer edges of the roadway. The materials will not compress evenly under the roller, and an uneven surface results. The better plan is to dump on boards, and spread on to the roadway with shovels, or to use certain types of wagons by which the materials may be spread quite uniformly in dumping. If the stone must be dumped in windrows, it should, at least, be harrowed when spread.

The base should be filled with a finer material, which keeps the foundation material from working up into the base, or the bituminous binder from the top course from penetrating down into it and being wasted. Any inequalities of surface are also remedied with this material, and the base brought to the desired crown and grade. A road gravel may be used for this purpose, if cheaper than stone screenings.

This base may be constructed of a softer and cheaper grade of stone than for the wearing surface. It is often possible to use a local material for this purpose, but, the poorer the material, the thicker should be the course.

In constructing the wearing surface, a hard and tough stone is desirable. The course is laid in the same manner as the base course, and usually is from 2 inches to 3 inches thick. It is

necessary that the stone be absolutely clean and free from dust, and dry, so that the bitumen will stick to it. For a 2-inch top, stone from 1½ inches to 2½ inches is the most desirable size. Stone passing a 2½-inch screen will roll down satisfactorily in a 2-inch top course. The size of the stone depends somewhat on the hardness. It should all be nearly the same size, in order to leave this course open to receive the binder. The stone should then be rolled as long as the character of the stone will permit. An experienced roller-man will be able to detect when the stones begin to crush and wear on each other, when it has been rolled sufficiently. The softer materials can not be rolled very much, as the voids will be closed and the surface will go together too much to permit of the proper penetration of the bitumen. If the proper size stone is used for this course and it is well rolled, much will be added to the stability of the pavement by the proper interlocking of the stone. A penetration pavement depends upon this interlocking of the stone in the wearing surface, to prevent rolling and pushing under traffic, quite as much as upon the binding together by the bitumen.

The next step in the process of construction is the application of the binder. This is an asphalt or tar of suitable consistency and characteristics, which is applied hot, either by hand or from pressure distributors. If the wearing surface has been properly laid, it will take up from 1½ gallons to 1¾ gallons per square yard of road surface. This application should be very carefully applied, so as to obtain uniformity of treatment, or fat spots will result. Follow up the treatment with a thinly spread layer of stone, passing the ½-inch or ¾-inch screens, with the dust screened out, and roll this well into the wearing surface. After rolling, the surface is swept free of all dust and loose material, and a seal coat of ¼ gallon per square yard applied. This is followed by a coat of cover material of stone screenings, and rolled, if desired. This cover material is worked into the voids between the surface stones, and a smooth and compact surface results. If on hillside work, the seal coat may be left off, so as to form a rough surface. A pavement of this type will improve after it has been down a short time and the binder has worked up to the surface and formed a mat.

In practice, the plant necessary for laying this type of pavement is very inelaborate. The bitumen may be heated in portable kettles, taking care not to allow the temperature to approach the burning point. Three hundred and fifty degrees Fahrenheit is the maximum temperature that should be allowed. If there is water in the bitumen, it will have to be heated gradually and the temperature raised slowly, to prevent foaming. The material can then be applied by hand or from pressure distributors. While the latter is preferable, the former gives satisfactory results, with proper care.

A pouring pot having a broad spout should be used, the operator walking backward, without swinging the pot from side to side. The uniformity of the pavement surface depends very much on the uniformity of this treatment. A 10-ton steam roller and a few teams for hauling complete the plant equipment. With this simple plant a city may easily and economically build its own pavements.

The tendency now is to break away from the practice of having a pavement built under a five-year guarantee. Engineers are finding it cheaper and more satisfactory to specify what they want in a pavement, to have their inspectors see to it that the specifications are lived up to, and to maintain the pavement with city forces. Not only is this method cheaper, but the pavement may be kept in good condition at all times, and cuts made by public service corporations repaired without delay. Here the penetration pavement is particularly advantageous, as small repairs may be done economically by a municipal repair squad.

Considerable repairing of penetration pavements has been done in the East by cold mixtures. About 18 to 20 gallons of the asphalt oil or tar are added to a cubic yard of graded aggregate. The whole is thoroughly mixed, the hole to be patched cleaned out, painted and filled, and the patching material patted down with a shovel, leaving it a very little higher than the surrounding pavement, to allow it to pack under traffic. These patches may be mixed on the job in the desired amounts, and should prove inexpensive. It is not usually considered good practice to use a different kind of material on patchwork than in the original construction.

In all types of bituminous pavements, it is necessary to keep a thin surface mat of bitumen and sand or screenings covering the pavement proper. This, in the speaker's opinion, is the secret of longevity of a pavement. When this mat wears off, the mosaic appearance so familiar to us all is in evidence. The stone begins to wear, and the wearing course becomes thinner. This should never be permitted. The wearing course would wear entirely away in a few years, and have to be replaced at considerable expense, while a fresh flush coat can be applied every few years, as it may be needed, at a cost of only a few cents per square yard.

We read of pavements in the East that have been down forty years, and upon investigation we find that, as soon as the stone begins to show up, as above stated, the street received a paint coat of bitumen and cover material, which took the wear until the stone again began to appear, when the treatment was repeated. There seems to be no good reason why the life of a pavement, whether penetration or mixed, should not be prolonged indefinitely in this manner. We would not think of letting the top course wear away and expose the base course to traffic, so why should we let the thin surface mat wear away and expose the top course to wear? In the speaker's opinion, this bituminous mat is just as important a part of the pavement as either the top or base courses.

One cause of ravelling of penetration pavements is the splintering of the fragments of stone by blows from the caulks on the horses' shoes. These fragments pick out, and a hole is the result. If a large per cent of the traffic is motor driven, it may be able to keep these places ironed out, but the trouble will probably not occur if the surface mat is intact.

The penetration road is a satisfactory road when properly constructed. It should have a wide field of usefulness in streets not having extremely heavy traffic, and should become a popular type of construction for highways outside our municipalities. Undoubtedly it is destined to come more and more into use in county and state highway construction, as has been the case elsewhere; and this will be fortunate, since this pavement is cheap, durable, and suitable for all kinds of vehicles which may be used thereon.

A DISCUSSION OF ROAD MATERIALS

By J. P. Nash, Testing Engineer, Bureau of Economic Geology and Technology, University of Texas

Synopsis: A brief discussion on the type of road suitable for the traffic to be carried, considering each type of road material separately as to its necessary properties. Includes a discussion of sand-clay, gravel, crushed-stone macadam, concrete, brick, rock-asphalt, and shell, with a plea for more favorable railroad rates on road-building materials.]

It has been variously estimated that from twelve to twenty million dollars was spent during the past year for road work in this state, and it has also been prophesied that there will be as much as thirty million spent during the current year. As the greater percentage of this money is spent for new construction and re-surfacing old construction, it is very essential that the road material used be the best obtainable. With the lower types of construction, such as the sand-clay or gravel roads, the proportion of the money spent in building the road will be about 40 per cent of the total amount. As the higher types of road construction are approached, such as the water-bound bituminous macadam, the materials represent a still larger percentage of the total cost, perhaps 60 per cent. Still higher in the scale of road construction, such as the concrete, brick, or asphaltic concrete road, the material cost will range somewhere between 60 and 70 per cent of the improvement.

The necessity for using the best materials that can be found in a locality, as can readily be seen, is absolutely essential, if the taxpayers are to receive full value for the money they give for these improvements. If, by the use of a better material, it is possible to give the road one more year of life, it certainly is a paying proposition to investigate completely the whereabouts and the value of each road material in that locality. This is the method of doing business that all large and successful corporations use. They must see to it that they are to receive full return for the money, before capital will be extended for the project.

If road building were carried on under a system similar to that used by these corporations, there would be fewer sand-clay and gravel roads built for modern traffic from twenty-year to forty-year bond issues, as is now a daily occurrence. Self-protection would dictate this.

The state laws of New Jersey recognize this fact when they require that the bond issue shall be limited in time according to the type of road and the materials used. Five years is the limit which a bond issue may run, if the type of road to be constructed is gravel; ten years, if macadam, and twenty years, if concrete, brick, or bitulithic. And it should be noted, further, that the gravel roads of New Jersey are constructed much better than those of our state; in fact, the gravel roads of New Jersey are noted in this country for their general satisfaction.

It is very hard to understand why a commissioners' court will construct a sand-clay or gravel road for the heaviest traffic highways, when it knows before building the road that as much as 80 per cent of the traffic will be motor-drawn vehicles. This type of construction passed away with the advent of the automobile. It is a notable thing when we consider how the methods of transportation have changed in the last century, and yet the average road built today in Texas has little improvement on those built a hundred years ago. It should not be inferred that sand, clay, or gravel roads are not a satisfactory type of construction, but they are not satisfactory or economical from the standpoint of modern traffic. If, for any reason, one should doubt the type of traffic which a road must stand, it would pay him to spend a day or two each month in taking a traffic census of a few of the main traveled roads, and I feel sure he will agree that the greatest proportion of this traffic consists of motor-drawn vehicles.

The proper type of road is one that will suit the traffic. This means that the materials used must not only be the best that can be had, but must also be of a type which will withstand the traffic that the road must carry. These two facts are of equal importance, and both deserve considerable attention. It is well, however, briefly to outline what is the best material of

each class, and leave it to the traffic on the individual road to determine what class should be put in. This class distinction might roughly be decided by noting whether the road carries mostly steel-tired vehicles or motor-driven vehicles. Modification of these classes lies also in the number and weight of the vehicles; that is, roughly, in whether the road is a through highway or merely a secondary road.

To pass on to the best grade of materials for the different classes: First, the earth road should be considered, but it is unnecessary to dwell upon that, for the reason that construction of the earth road lies only in such matters as drainage, alignment, and grade.

The sand-clay road, however, deserves some attention. To make a successful sand-clay road, it is essential that both the sand and clay have properties which are suitable for the purpose. The clay must be one having good binding qualities,—also one that will remain intact and not break down into mud as soon as it comes in contact with water. Usually, it is the poorer binding clays that slack easily. The duty of the clay is to bind the particles of sand together in a compact mass that will remain intact through dry spells. A red iron-oxide clay is very satisfactory. The sand should be rather coarse grained, and, if possible, well graded. The failure of most sand-clay roads can be laid to poor sand rather than to the clay. A fine sand is not satisfactory, for the reason that when the road is wet such a fine sand fails to do the work which it is supposed to do; namely, that of supporting the traffic during the wet spells. There are many so-called gravel roads built which are really sand-clay roads, as pebbles making up these gravels are possibly only ½-inch or ⅜-inch in size. Such gravels are recommended by the laboratory only as sand-clays, and should not be expected to give service such as is obtained from a real gravel road, except perhaps as a binder course.

The question of the amount of clay and sand which presents the best road surface is one of importance, but no set rule can be laid down for these proportions, as this is a matter of trial. There should be, however, enough clay mixed with the sand to bind the grains together, and this will usually be from 20 to 35

per cent of the sand. A sand-clay road is, perhaps, one of the most difficult of roads to construct, in that it takes constant care in building, and should be maintained for many months after the road is virtually completed, as weak spots invariably develop.

Such a type of road is only satisfactory for a medium horse-drawn traffic, and, even if this kind of traffic is considerable in volume, the gravel road would prove more economical and efficient.

This brings up for consideration just what constitutes a good gravel for road construction. Theory and practice agree well upon the qualities that a good gravel should have. In the first place, there should be sufficient quantity of large stone between ⅛ inch and 2 inches in size to support the weight and take the wear of the vehicles. These larger stones, which are invariably rounded, must be held in place by a filler of sand, so that they will be unable to move. Now, the sand and the gravel will make a dense surface, but it is necessary that there be another ingredient to bind these together, and this is the function of the clay. Like that recommended for the sand-clay road, the clay in the gravel should have good cementing qualities.

The coarse pebbles between ⅛ inch and 2 inches in size should constitute from 60 to 70 per cent of the gravel, the sand and clay together to make up the remainder. It has been found that from 12 to 20 per cent of clay is sufficient. It is hard to convince the average citizen that this is a satisfactory gravel, as it has a very lean appearance when placed on the road. After it carries traffic for a few months, it sets up into a much more satisfactory surface than does one which contains a greater proportion of sand and clay. A gravel having these proportions is somewhat difficult to find, as the average gravel contains too much sand and only a small proportion of stone.

The above proportions of clay apply to a gravel in which the stones have no cementing values, such as a flint and quartz gravel. With a limestone gravel, the proportions can be altered. This is due to the fact that the stones are usually softer, and are being continually worn by the traffic. This condition permits the use of a gravel having little fine material, and, in

fact, it is desirable that it have but little. The proportion of sand to stones should be the same; namely, 1 to 2, but it is unnecessary that more than 7 per cent of fine material be present. As with the flint gravels, this, also, will seem to be lacking in fine material, but, after the road is compacted, it will be a superior road. The sand under ⅛-inch should be composed of hard limestone, similar to the coarse pebbles, and should constitute about 30 per cent of the compacted road. In all gravels or sands for road work, it is essential that the pebbles composing them be hard and tough, in order to resist the wear. Toughness is probably more essential than hardness, as the smaller pebbles must resist considerable impact or be ground into dust.

Above everything else, a gravel road is satisfactory only for medium or heavy horse-drawn traffic, but is in no sense suitable for automobile traffic. There are a number of localities in this country where it can be demonstrated that gravel roads for automobile traffic are a sound investment, when well maintained, but none of these localities are in Texas. The climatic, soil, and material conditions must all be exceptionally favorable to make the gravel road economical for heavy motor traffic, but in this state these things are not present to sufficient degree. Gravel roads have been given a satisfactory surface in recent years for motor traffic by treating them with asphaltic oils and tars. As satisfactory as these treatments may have been, there is little doubt that they would even prove more economical on a crushed stone road.

This brings us to another type of road material deserving consideration: crushed stone. This is superior to the gravel in many respects, chief of which are its uniformity and the interlocking action of the stone. It is essential, however, that the stone have qualities to resist the wearing action of traffic. The stone must resist the impact of the horses' hoofs and of steel-tired vehicles, the wearing action of traffic on the road surface, and also the internal friction of the stones one upon another within the body of the road, due to the weight of the vehicles. In other words, the stone must be tough, it must have a high resistance to wear, and it must be hard. Another quality re-

quired of the stone is that it have good binding qualities. This latter feature is becoming less and less important, as practically all stone roads built in this state are bituminous roads. When the old water-bound macadam road was in vogue, this binding property was one of prime importance, as it was the binder that held the stones together and kept the road smooth. This natural stone binder has given way to the more satisfactory artificial binders, the most common of which are the asphalts, oils, and tars.

While bituminous binder in a macadam road reduces to a considerable extent the shock and wearing action of traffic on the stones, there is yet great need of stone which will resist these forces. The ordinary narrow-tired wagon used in this state, with a two-ton load, would mean, a pressure of about 1,000 pounds on each wheel. This would be about 166 pounds per square inch on the road surface, considering that the tire is but 2 inches wide and has about 3 inches of its circumference in contact with the road at one time. Should this vehicle drop as much as ½ inch, due to a depression in the road, there would be enough impact from this blow to break a 1-inch piece of the ordinary limestone found in the state. This weight will also compress the road surface enough to cause slight friction between the stones, thereby wearing them to a certain extent. The impact of the steel-shod horses' hoofs breaks the stones also. With the motor-drawn vehicle, practically all of this impact is eliminated, due to the cushioning effect of the rubber tires. However, there still remains the internal wear due to the weight of the vehicle, and the shearing action of the rear wheels.

It is necessary that the stone have properties to resist these various destructive forces, and these properties can be shown very clearly by tests on the material. Unless a person has had considerable experience in judging these properties in a stone, it is very difficult to determine, without testing, the actual properties of various materials, as the actual figures give an excellent method of comparison.

It has been said by many people that Texas has no suitable stones for road construction, but this is far from the truth. There are limestones in this state which are equal, and in many

cases superior, to those of New York, Pennsylvania, Illinois, or practically any state that might be mentioned where roads are constructed of these materials. There is trap rock found here equal to that of New York, Washington, or Oregon. There are granites in the Burnet and Llano country which are equal to those of Vermont or New Hampshire, Colorado or any other granite-laden state, and there are sandstones in the northeastern section of Texas which are as hard and as tough as any that can be found elsewhere. The real fact of the matter is not that good road building rock is absent, but that it is rather poorly distributed. One of the most important and far-reaching benefits which the State Highway Commission can do for road improvement in this state will be to secure favorable rates for the shipment of these materials for road-building purposes.

The high cost of transporting these materials, coupled with the ignorance of their existence, is the chief reason that they have not been used to a greater extent.

In the construction of a concrete road, the question of satisfactory materials is one of paramount importance, not only in the wearing qualities of the various materials that make up the road, but also in their relative proportions. Whether gravel or crushed stone is the most satisfactory material to use is also a live question. It has been demonstrated in the laboratory, and it is believed that it will hold true in actual construction, that a limestone would present a more uniform surface than gravel after the road has commenced to wear, other things being equal. This statement, however, requires some modification, first in regard to the character of the gravel, and second in regard to the richness of the mortar. The gravel is usually rather nonuniform, being composed of both hard and soft pebbles, the softer ones wearing much faster than the hard material, such as flints and quartz, causing the road to become rough. The limestone, being uniform in character, will allow all the stones to wear equally in amount, thereby presenting at all times a smooth surface, which is the one thing desired above everything else to make a satisfactory road. It is believed, also, that the wearing qualities of the mortar should vary with the hardness of the stone. In other words, if a stone having high resistance

to wear is used, the mortar should be rather rich; for instance, about 1 to 1½. This question of the concrete road is a very broad one, and therefore cannot be discussed further at this time.

Passing on to the consideration of the brick road, the question of the materials of this type of construction depends, to be sure, on the quality of the brick. Good brick should have a high resistance to wear and considerable resistance to impact. Besides these qualifications, it is also necessary that they be of such size and weight that they can be handled easily. Various tests are made to determine the wearing qualities of the brick, the most successful of which subject the brick to a real wearing action, such as is done in the rattler test.

There are no country roads constructed of brick in this state, and in most of the towns this type of construction is considered a luxury for only the heaviest traffic streets. This is due to the fact that the traffic is not dense enough to make this an economic form of construction. At the present time, there is but one plant manufacturing paving brick in this state, although there are numerous very satisfactory deposits of clay and shale, which, if properly handled, would make excellent brick for paving.

There are other materials used in highway construction which are used mainly for city streets, and will not be considered in this discussion. However, mention should be made of a natural material which exists in the state, and has recently entered into the sphere of country-road construction. This material is rock-asphalt. The material itself is a soft shell limestone, impregnated with from 8 to 14 per cent of asphalt, the general average being about 11 per cent. There have been a number of miles of city streets built with this material, but recently the method of handling and placing it on a road without the addition of heat has been devised. This material is used as a top course for heavy traffic roads that have a good foundation, or, if such a foundation does not exist, it can be constructed usually with crushed stone or compacted gravel. The necessary precaution in using this rock asphalt is that it must be uniform, and, as the material in nature does not possess this property, it

is necessary that it be supplied to the material, by the addition of some flux or asphaltic oil.

While there are a number of deposits of rock asphalt in the state, there is but one that is worked commercially. The field of economical uses of this material is somewhat limited by the cost of transportation.

Shell as a road-building material is satisfactory for ordinary horse-drawn traffic, but the great clouds of dust which arise from a shell road when a fast moving automobile passes over it spells its doom for modern traffic. There are, however, some qualities which shell must have to be satisfactory for any road, such as a degree of hardness and binding qualities. Lacking either of these qualities, the shell should never be used. The great problem with this type of construction is not so much one of material as it is one of how to treat the road so that it will not blow away, as the shell forms a hard and smooth surface when protected from water and wind.

The above brief discussion of road-building materials might be summed up into one sentence: Use a material suitable for each kind of traffic. The most reliable method of determining the value of the material is by laboratory tests, as a direct comparison with satisfactory roads can be made by means of figures.

B119 917 1516

University of Texas Bulletin

No. 1736: June 25, 1917

Honor List

OF THE

College of Arts and the Department of Engineering

TOGETHER WITH

Table of Grades

FOR THE

Main University, Session of 1916-17

Published by the University six times a month and entered as second-class matter at the postoffice at
AUSTIN, TEXAS

The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston

Cultivated mind is the guardian genius of democracy. . . . It is the only dictator that freemen acknowledge and the only security that freemen desire.

Mirabeau B. Lamar

PREFACE

METHOD OF GRADING.

Grades at the University of Texas are recorded by means of *letters* in the College of Arts, Department of Education, and Department of Engineering, and by means of *numbers* in the Department of Law. In the former case A denotes excellent, B good, C fair, D pass, E failure, F bad failure with privilege to continue the course, G bad failure without privilege to continue the course; in the latter case 100 is the highest possible grade and at least 80 is required to pass. In tabulating the Law grades, 80 to 84 have been arbitrarily listed as D's, 85 to 89 as C's, 90 to 94 as B's, 95 to 100 as A's.

HONOR LIST.

During the winter of 1913 the Faculties of the College of Arts and Department of Engineering voted to resume the practice long discontinued of printing annually an honor list of the students making grades of A or B in any of the courses offered in those departments. It was hoped that this slight recognition of good scholarship would be helpful. Athletic, debating, social, political, and various other distinctions await the capable and ambitious student and are eagerly sought, and it is clear that good scholarship will be increased by giving it a dignified publicity.

In the following Honor List, after the number and name of the course is given the total number of individual men and women students registered in the course. The ratios between these two numbers and the number of men and women listed for honors A (excellent) and B (good) obviously indicates the relative frequency of honors in the course both for men and for women and for the course as a whole. To be included in the Honor List the student must have begun and ended the course during the session of 1916-17. To be listed as excellent the student must have made an A in the course each term of the course. Since very few high rank students make part of a course one year and part the next, the Honor List is very nearly a complete list of students securing A or B averages in each course.

For Phi Beta Kappa, senior standing in the College of Arts and an average of at least B is required. Not more than one-eighth of the candidates for the Bachelor of Arts degree may be admitted. The average grade of those admitted is always distinctly above B.

For Sigma Xi, graduate standing is required and the student must have performed or give clear promise of performing research in the natural sciences.

GRADE STATISTICS.

Following the Honor List will be found a table which gives

I. *The total registration in thirds of a "full course" as a unit* for each course and section given at the Main University in 1916-17. This number would be equal to the total number of passing grades in the course if each and every student who registered for the course remained in the course till the end and passed all of it.

II. The total number of passing grades.

III. The percentages of the passing grades which were A's, B's, C's, D's.

(The figures in I are unavoidably not as accurate as those in II and III.)

The differences between the numbers in I and II give the amounts of failure to pass. This failure is due to (a) leaving the University, before the end of the session, (b) dropping the course before its completion, (c) postponing a part of the work of the course by an approved petition, (d) getting an E or an F or a G on all or part of the course. Leaving the University is responsible for from one-fourth to one-third of the failure, dropping the course before finishing it is responsible for a somewhat larger proportion, while getting an E is responsible for most of the remainder. Postponements, F's and G's do not account for as much as one-tenth of the failure.

For grades at the Main University during the sessions of 1910-11 and 1911-12, see Bulletin No. 253; for grades during the session of 1912-13, see Bulletin No. 296; for 1913-14, see Bulletin No. 359; for 1914-15, see Bulletin No. 36 1915; for 1915-16, see Bulletin 36, 1916.

This Bulletin was prepared by Miss Eva McDonald, Secretary to the Dean of the College of Arts.

GRADE STANDARDIZATION.

The Faculties of the College of Arts, Department of Engineering, and Department of Education, in order to attempt to standardize grading to some extent, have decided that hereafter in all classes, where the number of individuals exceeds 10, the percentage of A's shall be from 8 to 12; the percentage of B's shall be from 27 to 33; the percentage of C's shall be from 36 to 44; the percentage of D's shall be from 15 to 25 unless some reason for departing from these limits be shown. The relation between the total registration in thirds and the number of passing grades will be left as heretofore entirely to the discretion of the instructor.

HONOR LIST, 1916-1917

COLLEGE OF ARTS

Phi Beta Kappa

Baen, Mary Alice; Baker, Hines Holt; Baker, Rex Gavin; Blattner, Mary Anne; Bostick, Merrie Tully; Brand, Clarence Eugene; Calhoun, Thomas Jefferson; Clapp, Sarah Lewis Carol; Davis, Madge; Dawson, Cordelia Jane; Faust, Chas. George, Jr.; Feuille, Estelle; Glover, Estella; Goldstein, Estelle; Hall, Ruth; Hatch, Josie Allen; Higdon, John Cline; Leary, Verne; Sowell, Lois Lee; Trice, Lois Baird; Ware, Lois Phillip; Wood, Ben Dekalb.

Sigma Xi

Barber, Alda Grace; Janoch, Lillian Mary; Kniker, Hedwig Thusnelda; Moore, Norman Hall; Vanneman, Aimee Sherin; Weber, Roxie Adeline.

Applied Mathematics

1. Introductory Course (5 Women, 93 Men). *A (Excellent)* Kennedy, E. C.; Trau, F. G. *B (Good)* Barker, L. B.; Bailey, D. P.; Bunsen, A. W.; Campbell, C. B.; Carniero, M.; Castle, W. R.; Clements, V. H.; Eichenroht, Marvin; Hobbs, O. K.; Holder, M. H.; Newby, A. B.; Roberts, F. R.

15. Advanced Calculus (7 Men). *B (Good)* Nerens, Roy.

104f. Advanced Coudse in Analytics (2 Women, 63 Men). *A (Excellent)* Collins, W. H.; Laird, S. T.; O'Banion, A. L.; Rosendahl, H. O.; Seaholm, W. E. *B (Good)* Archer, O. B.; Hedick, B.; Knight, H. C.; Lawrence, M. T.; Maxwell, A. C.; Nivens, K. B.; Roberts, F. G.; Tinoco, Luis; Towne, H. R.

207 fw. Advanced Calculus (14 Men). *A (Excellent)* Hodges, T. A.; Nichols, M.

208. Advanced Calculus for E. E. (21 Men). *A (Excellent)* Wear, J. P. *B (Good)* Franke, L. A.; Seebe, A.; Zuhlke, E.

209ab. ws. Calculus (1 Woman, 84 Men). *A (Excellent)* O'Banion, A. L. *B (Good)* Collins, W. K.; Lain, C. B.; Laird, S. T.; Lawrence, M. T.; Roberts, F. G.; Seaholm, W. E.

214ws. Popular Astronomy (5 Women, 7 Men). *B (Good)* Normand, E.; Ross, J. W.; Von Koeneritz, Helen; Woodul, Lottie.

ASSOCIATION OF RELIGIOUS TEACHERS

1. FUNDAMENTAL CONCEPTIONS UNDERLYING GREATNESS OF JEWS (3 Women). *B (Good)* Read, Mary Lee; Allen, Mary Louise.

2. LIFE OF THE JEWISH NATION (4 Women). *B (Good)* Bentley, Mabel; Smith, Nancy.

3. OUTLINE STUDY OF NEW TESTAMENT (4 Women, 2 Men). *A (Excellent)* Gray, Mamie. *B (Good)* Gray, Mattie.

5. NEW TESTAMENT HISTORY AND LITERATURE (1 Woman, 3 Men). *A (Excellent)* McKinstry, Nellie. *B (Good)* Glaze, W. E.; O'Banion, O. L.

18. CHRISTIAN ETHICS (2 Women, 1 Man). No honors.

104f. SOCIAL IDEALS OF HEBREWS (5 Women, 1 Man. *A (Excellent)* Young, Jeffie. *B (Good)* Ballew, Zulu; Craig, Bess; Stullken, Florence.

105w. SOCIAL TEACHINGS OF JESUS (9 Women, 5 Men). *A (Excellent)* Hatley, R. O.; Hawkins, Eudora; Nelson, Grace; Young, Jeffie. *B (Good)* March, Lucy.

106s. PHILOSOPHY OF RELIGION (9 Women, 5 Men). *A (Excellent)* Young, Jeffie; Carwile, Mabel. *B (Good)* Abraham, Lucile; Morrow, Tennie; Washington, H. A.

111s. LIFE AND LETTERS OF PAUL (14 Women, 1 Man). *A (Excellent)* Barlow, Vivian; Boone, Lalla; Dameron, Travis; Murchison, Mary; Shuler, Mary. *B (Good)* Daniels, Camille; Harrell, Dorothy; Hawkins, Eudora; Rootes, Virginia; Stephens, Ellenora; Withers, Mattie.

112f. THE ETHICS OF JESUS (15 Women, 5 Men). *A (Excellent)* Crow, Louise; Hunt, Virginia. *B (Good)* Byers, J. H.; Carwile, Mabel; Dudley, Ruth; Goodman, H. H.; Hill, Marian; Jackson, Katie; Lawrence, Della; Peyton, H. C.; Sleeper, Martha; Stewart, Margaret; Taylor, Helen; Washington, H. H.; Watson, Adele.

114 s. THE SOCIAL MESSAGE OF JESUS (35 Women, 9 Men). *A (Excellent)* Blattner, Mary Anne; Bennett, Edith; Edmond, Flora; Fish, Asa; Hall, Ruth; Jackson, Lillian; Lancaster, Linda; Porter, Nellie; Thompson, Minette. *B (Good)* Ball, Grace; Bass, Bessie; Cheesborough, Floride; Clark, Margaret; Dudley, Ruth; Goodman, H. H.; Harniss, Leah; Hartson, Alline; Hilgartner, Anna Bell; Hill, Marian; Jackson, Helen; James, Bessie; Lawrece, Della; Lightfoot, Grace; McCullough, Flora Lee; Molesworth, Kathleen; Peyton, H. C.; Rennie, Margaret; Seale, Pauline; Stewart, Margaret; Tedford, Randolph; Whittaker, Bertha; Wilson, Fannie.

118w. THE SOCIAL MESSAGE OF THE PROPHETS (32 Women, 9 Men). *A (Excellent)* Blattner, Mary Anne; Edmond, Flora; Hawkins, Marion; Russell, Pearl; Sleeper, Martha; Stewart, Margaret; Whipple, Lester. *B (Good)* Ball, Grace; Goodman, H. H.; Jackson, Katie; Lawrence, Della; Lightfoot, Grace; Locke, Eunice; Molesworth, Kathleen; Peyton, H. C.; Taylor, Helen; Thompson, Minette; Tedford, R. C.

206 fw. LIFE OF CHRIST (12 Women, 1 Man). *A (Excellent)* Barlow, Vivian; Boone, Lalla; Dameron, Travis. *B (Good)* Daniels,

Camille; Hartson, Alline; Lightfoot, Henryetta; Lee, Blanche; Shuler, Mary.

Bohemian

1. Elementary Bohemian (5 Men). *A (Excellent)* Jurcak, Vlasta. *B (Good)* Chovanetz, Charles.

2. Intermediate Bohemian (1 Woman, 2 Men). *B (Good)* Mondick, Angela; Machacek, Emmitt.

Botany

1. Elementary Botany (92 Women, 32 Men). *A (Excellent)* Corbin, Vida; Dobie, S. N.; Killian, Oscar; Lamar, Lois; Meyer, May; Sandstrom, O. W.; Stephana, Sister. *B (Good)* Ardie, Gladys; Benson, Mary; Camp, Carrie; Chovanetz, Charles; Cox, Mary; Crawford, C. L.; Glass, Elizabeth; Gordon, Alma; Greene, Frances; Greene, Lila; Greer, J. B.; Jenke, Kathryn; John, Margaret; Johns, Flora; Jones, L. J.; Karling, Jno.; Kerns, Evelyn; Nance, Grace; Rice, Margaret; Rogers, Elinor; Sleeper, Margaret; Waddill, Margaret; Waitman, Willie.

21. Taxonomy of the Seed Plants (1 Woman, 1 Man). *B (Good)* Buice, W. A.

27. Systematic Botany (1 Woman, 3 Men). *B (Good)* Allen, Ena; Warren, W. H.; Winkler, A. J.

29 and 29a. General and Sanitary Bacteriology (10 Women, 11 Men). *A (Excellent)* Denny, Grace; Goff, Gomer; Stiefel, Dan; Warren, Wm. H.; Weber, Roxie; Winkler, A. J. *B (Good)* Belger, Harriet; Byrd, Alice; Collins, Bailey; Gillespie, Martha; Megee, Louise; Roundtree, Mary; Nerens, Roy; Upton, R. G.; Woodul, Lottie.

42. Research Problems (1 Woman, 1 Man). *A (Excellent)* Riesecke, Linda. *B (Good)* Dodd, S. H.

139. Botanical Seminary (5 Women, 3 Men). *A (Excellent)* Riesecke, Linda; Hofer, Leslie; Segal, Rosebud. *B (Good)* Bailey, E. L.; Hale, Beulah; Stalmach, Adolph.

406. Histology and Cytology (2 Women, 2 Men). *B (Good)* Dodd, S. H.; Hale, Beulah.

418. Elementary Plant Physiology (7 Women, 7 Men). *A (Excellent)* Bowles, C. E.; Davis, A. R.; Segal, Rosebud.

Business Administration

11. The Theory and Practice of Accounting (2 Women, 77 Men). *A (Excellent)* Fichtenbaum, Maxie; Harritt, Chas.; Jackson, J. L.; Wilson, M. *B (Good)* Abbott, R. W.; Albritton, Ford; Beecroft, S. R.; Brown, Over; Drumwright, McNeill; Hooper, E. C.; Jones, H. L.; Jones, T. E.; Langston, W. G.; Phillips, Jack; Rawlins, Bert; Rosenahl; Walker, F. E.; Wilson, C. R.

12. Advanced Accounting and Auditing (21 Men). *A (Excellent)*

Mothershead, B. S.; Howard, Alva. *B (Good)* Carter, R. B.; Ward, W. D.

23. Business Law (3 Women, 64 Men). *B (Good)* Adams, F. W.; Beecroft, F. E.; Beecroft, S. R.; Fichtenbaum, M.; Gatewood, W. S.; Graham, F.; Higdon, J. C.; Murray, W. B.; Post, M. H.; Ray, W. L.; Sears, Florence; Wilkes, J. L.

24. Investments (11 Men). *A (Excellent)* Adams, F. W. *B (Good)* Beecroft, F. E.; Hargrove, N. C.

26. Foreign Trade (9 Men). *A (Excellent)* Adams, Fred W.; Post, M. H. *B (Good)* Beecroft, F. E.; Howard, A. R.

110 f. Business Principles (12 Women). *A (Excellent)* Johnson, Ruth; Murphy, Madaline; Wright, L. H. *B (Good)* Field, Bernardine; Gray, Sarah; Lightfoot, Henrietta; Molesworth, Kathleen.

121 s. Cost Accounting (10 Men). *A (Excellent)* Post, M. H. *B (Good)* Howard, R.; Schumacher, A. H.

123 f. Accounting and Financial Problems (4 Men). *B (Good)* O'Donnell, W. C.

124 w. Government Accounting (3 Men). *A (Excellent)* O'Connell, W. C. *B (Good)* Carter, R. B.

125 s. Seminar (4 Men). *B (Good)* O'Donnell, W. C.; Schumacher, A. H.

127 f. Property Insurance (19 Men). *A (Excellent)* Clemens, E. *B (Good)* Brengle, J. S.; Howard, A. R.; Mothershead, B. S.; Post, Marvin.

128 f. Seminar on Chamber. of Commerce (2 Men). *A (Excellent)* Clark, James; Saner, O. B.

218 ws. Selling Problems (35 Men). *A (Excellent)* Adams, Fred; Brengle, J. S.; Post, M. H.; Ward, W. D. *B (Good)* Jackson, J. L.; Phillips, Jack; Ragsdale, S. B.; Wilson, J. M.

221 fw. Management of Business and Industry (12 Men). *A (Excellent)* Fichtenbaum, Max; Post, Marvin. *B (Good)* Carter, R. B.; Gatlin, E. D.; Howard, Roscoe; Hudson, H. H.; Schumacher, A. H.; Brengle, J. S.

227 ws. Banking Practice (30 Men). *A (Excellent)* Knight, M. A.; Mothershead, A. R. *B (Good)* Carter, R. B.; Francis, D. G.; Gidley, C. L.; Jones, H. B.

Chemistry

1. General Chemistry (250 Women, 261 Men). *A (Excellent)* Alvey, Gleen; Baker, Leonard; Booth, Jewel; Borden, Minnie; Brady, J. J.; Burrel, Julia; Christenson, Clara; Eikel, Linda; Goldsmith, Gertrude; Gracey, Mary; Granger, A. T.; Hawkins, Eudora; Lang, W. A.; Masters, Mildred; Middlebrook, Hattie; Miller, J. D.; Nelson, Elizabeth; Nichols, M. C.; Peace, D. W.; Segal, Rosebud; Seymour, Cora; Stullken, Florence; Timmins, B. H.; Williams, R. L.; Wolflin, Lee; Yarbrough, Leta; Yarbrough, Minnie; Wilkinson, Annie. *B (Good)* Abernathy, Maidette; Archer, L. B.; Archer, O. B.; Baker, Lorena;

Barrow, Alice; Bass, F. R.; Beall, Jack; Bunsen, A. W.; Cardenas, Salvador; Carneiro, M.; Carter, F. C.; Castle, W. R.; Collett, Jeanette; Collier, W. B.; Cox, Walter; Curry, W. N.; Doran, Agnes; Dornberger, K. B.; Drow, Viola; Durham, A. J.; Early, J. B.; Eichenroht, Marvin; Enloe, D. C.; Garner, J. T.; Gee, Mea; Gladney, Mildred; Glover, O. E.; Granberry, R. G.; Hamer, Annie; Harding, M. M.; Harris, Mary Edwina; Harritt, C.; Heavenhill, H. G.; Hill, L. E.; Hillyer, LeRoy; Hornsby, Hazel; Jordon, E. M.; Kallus, E. J.; Keese, W. H.; Kaden, J. B.; Lancaster, Linda; Lawrence, M. T.; Lowrey, L. G.; Marshall, C. H.; Martin, Lillian; Maxwell, A. C.; McKay, J. A.; McNeill, S. E.; Mead, Gertrude; Miller, Kathleen; Moore, H. R.; Morton, Ezra; Newell, Mary; Norris, R. S.; O'Banion, A. L.; O'Donnell, Annie; Potter, A. D.; Price, Ralph; Roberts, F. R.; Robinson, Annie; Ross, Crystal; Rowe, Frances; Reuckert, Alma; Shepard, Julia; Spence, Virginia; Stockard, Undine; Stroud, Frances; Surkamp, Richard; Thames, Arlee; Tucker, S. B.; Whitehouse, Eula; Whittaker, Bertha; Williams, O. K. B.; Winston, C. J.; Wulff, R. G.; Wynn, B. W.; Wynn, Nannie Lou; Zilker, Pearl.

2. Chemical Analysis and Its Theory (4 Women, 30 Men). *A (Excellent)* Bufkin, H. F.; Crager, Jay; Taylor, R. S. *B (Good)* Dunlay, Edward; Goforth, J. L.; Gorman, J. J.; Harper, H. W.; Hightower, Frank; Houston, Bruce; Lochte, H. L.; McNees, R. A.

19. Advanced Organic Chemistry (2 Men). *A (Excellent)* Pritchett, R. H.

20. Advanced Physical Chemistry (4 Men). *A (Excellent)* Buehrer, T. F.; McPherson, A. T.; Phipps, T. E.; Poindexter, F. E.

29. Physical Chemistry (4 Men). *A (Excellent)* Buehrer, T. F.; Craig, W. M.; Phipps, T. E.; Poindexter, F. E.

31. Organic Chemistry (2 Men). *A (Excellent)* McPherson, A. T.; Moore, N. H.

50. Elementary Physical Organic Chemistry (3 Women, 8 Men). *A (Excellent)* Clark, Roxie; Fahrentold. *B (Good)* Corley, W. M.; Meyer, May; Miller, P. T.; Ray, T. W.; Upton, R. G.; Weber, Roxie.

107. Descriptive Chemistry (172 Women, 208 Men). *A (Excellent)* Alexander, C. B.; Alvey, Glenn; Archer, L. B.; Averitte, Mary; Baker, L.; Boone, Lurline; Booth, Jewel; Bunsen, A. W.; Burrell, Julia; Byrd, Alice; Cardenas, S.; Castle, W. R.; Christensen, Clara; Collett, Jeanette; Collier, W. M. B.; Crook, Theo.; Davis, Willie; Deen, Earl; Drow, Viola; Eikel, Linda; Everts, M.; Fristoe, W. R.; Freeman, Ross; Goldsmith, Gertrude; Gracey, Mary; Granger, A. T.; Hart, E. R.; Haubold, E. G.; Hawkins, Eudora; Hill, L. E.; Hillyer, LeRoy; Hillyer, G. M.; Homan, Ralph; Jackson, Katie; Jones, B. D.; Junkin, F. H.; Kallus, B. J.; Keese, Walter; Lancaster, Linda; Leake, L. B.; Masters, Mildred; McCrummen, Tom; Meyer, Louise; Middlebrook, Hattie; Miller, J. D.; Nelson, Elizabeth; Newell, Mary; Nichols, M. C.; O'Banion, A. L.; O'Donnell, Annie; Paine, L. B.; Parson, Felix; Peace, D. W.; Peace, Ella; Robertson, Grace; Rueckert, Alma; Segal, Rose-

bud; Seymour, Cora; Struve, A. V.; Stullken, Florence; Tinoco, Lewis; Wachendorfer, Chas.; Williams, Ralph; Wohlberg, Manuel; Wolflin, Lee; Wynn, B. W.; Wynn, Nannie; Yarbrough, Leta; Yarbrough, Minnie. *B (Good)* Abernathy, Maidette; Alexander, Anne; Alsup, R.; Alsup, Rodney; Archer, O. B.; Bailey, Douglas; Baker, Lorena; Baker, Nannie; Beall, Jack; Berkeley, W. E.; Boyd, Jence; Brannin, Daniel; Breustedt, Lillian; Brigham, Lillian; Brown, J. L.; Brydson, Pauline; Caldwell, R. H.; Carpenter, Leslie; Chapman, J. A.; Crockett, L. O.; Dornberger, C. B.; Dougan, L. C.; Early, J. B.; Enloe, D. C.; Falvey, Mrs. D. D.; Gladney, Mildred; Granberry, Richard; Graves, E. G.; Hartel, Bernice; Heath, B. C.; Heavenhill, H. G.; Hopping, Flora; Hornsby, Hazel; Hornsby, M. M.; Housewright, Minor; Huff, G. D.; Jordon, E. M.; Kerzee, R. F.; Kirk, W. J.; Knox, Leona; Lang, W. A.; Lanier, Mary; Lawrence, M. T.; Lightfoot, Grace; Logan, W. B.; Maddox, Ada; Main, Emma; Matlock, Eugene; Maxwell, A. C.; McKay, J. A.; McLaughlin, Mildred; Meyer, Arthur; Meyer, Margaret; Milam, Maud; Miller, Juliett; Osburn, O. D.; Roberts, F. R.; Ross, Crystal; Rowe, Francee; Scurlock, O. D.; Seaholm, W. E.; Stephana, Sister Mary; Stephenson, J. B.; Storey, Corinne; Stroud, Lucile; Townsend, Hester; Waltmore, De Witt; Whaling, Ruth; Whitehouse, Eula; Whittaker, Bertha; Williams, J. A.; Winston, C. J.; Wolf, Ximena; Woods, Dever; Wulff, R. G.; Wynn, A. T.

110 w. Technical Analysis (1 Man). No honors.

112. Organic Chemistry (2 Women, 7 Men). *A (Excellent)* Lochte, H. L.; Pritchett, R. H. *B (Good)* Corley, Wm.; Marshall, Mrs. Bella; Ray, T. W.; Upton, R.

113 f. Advanced Qualitative Analysis (2 Women, 6 Men). *A (Excellent)* Fahrenthold, L. T.; Kariel, L. W.; Meyer, May. *B (Good)* Lochte, H. L.; Morford, Elizabeth; Ray, W. L.

114. Inorganic Preparations (1 Woman, 2 Men). *A (Excellent)* Craig, W. M. *B (Good)* McNees, R. A.; Morford, Elizabeth.

115. Inorganic Preparaitons (1 Woman, 1 Man). *A (Excellent)* Graig, Wm.; Barnes, Maud.

116. Quantitative Analysis (3 Men). No honors.

126. Electro-Analysis (1 Woman, 2 Men). No honors.

411. Organic Chemistry (1 Woman, 17 Men). *A (Excellent)* Fahrenthold, L. T. *B (Good)* Gore, A. L.; Hightower, Frank; Lochte, H. L.; Marshall, Mrs. Bella; Meyer, Mary; Ray, T. W.; Ray, W. L.; Upton, R.

440. Elementary Organic Chemistry (3 Women, 16 Men). *A (Excellent)* Ball, W. B. *B (Good)* Bowles, C. E.; Dodd, S. H.; Dunn, N. L.

Economics and Sociology

1. Principles of Economics (49 Women, 206 Men). *A (Excellent)* Alvey, Glenn; Graham, N. A.; Gulick, C. C.; Sehorn, E. *B (Good)* Anderson, S. C.; Ball, W. B.; Beverly, J. R.; Borden, M. L.; Boynton,

A.; Bufkin, H. M.; Cheesborough, Floride; Doran, Agnes; Field, R. M.; Greene, P. H.; Harritt, C.; Hartman, C. F.; Hazel, G. G.; Heimsath, C. H.; Hooper, E. S.; Kerr, J. L.; Kline, M. O.; Knight, R.; Lochte, H. L.; McNees, R. A.; Miller, H. O.; Naugle, W. A.; Nelson, O. E.; O'Donnell, Annie; Pope, F. S.; Ragsdale, S. B.; Shelton, M.; Shields, J. H.; Stroud, G.; Sykes, E. A.; Wacher, A. J.

2. Corporations and Railway Economics (30 Men). *A (Excellent)* Evans, H. C. *B (Good)* Davis, L. B.; Frame, R. O.; Moore, F. W.; Winston, C. K.

3. Economic and Financial History of U. S. (10 Men). *A (Excellent)* Christian, A. C.; Hartman, G. A. *B (Good)* Norton, F. E.

6. Principles of Economics for Professional Students (7 Women, 133 Men). *A (Excellent)* Laird, J. A. *B (Good)* Atkinson, J. B.; Baker, Leonard; Biggs, R. I.; Bigham, R. B.; Cardenas, S.; Clark, C. W.; Dale, W. J.; Damon, St. E.; Davis, N. H.; Fountain, O. A.; Hill, R. D.; Jackson, D. W.; Klapproth, C. L.; Lattner, S. O.; Martin, M. B.; Mosse, L. A.; Naeter, A.; Taylor, Helen.

11. Public Finance (14 Men). *A (Excellent)* Stewart, Frank. *B (Good)* Christian, Asa; Moore, Fred; O'Donnell, W. C.

12. Money, Banking, and Crises (1 Woman, 39 Men). *A (Excellent)* Higdon, J. C.; Lohmann, Irene; Watkins, L. B. *B (Good)* Etter, Leslie; Frame, R. O.; Kirk, O. W.; Knight, M. A.; Mothershead, B. S.; Ragland, C. M.; Rush, R. F.; Sherrill, H. L.

13. Social Problems (32 Women, 21 Men). *A (Excellent)* Wood, Ben D. *B (Good)* Boone, Lalla; Burg, Elsa; Davis, Mrs. Eugene; Doggett, Wm.; Goldsmith, Gertrude; Goodman, H. H.; Lohmann, Irene; Marsh, Lucy; McLean, Roy; Mobley, Helen; Norman, Emma; Penn, Eugene; Platt, Hazel; Potts, Ruth; Voorhies, H.; White, R. C.

15. Outlines of Sociology (12 Women, 8 Men). *A (Excellent)* Denny, Grace. *B (Good)* Boothe, Vida; Penn, E.

17. Economic Problems (1 Woman, 6 Men). *A (Excellent)* Watkins, Leonard. *B (Good)* Goodman, R.; Howard, Geo.

19. Economic Statistics (2 Women, 2 Men). *B (Good)* Platt, Hazel; Powell, Ward; Pryor, Margaret.

23. Problems of Population (1 Woman, 6 Men). *A (Excellent)* Baker, Rex; Mathews, E. J. *B (Good)* Baker, H. H.; O'Donnell; Meador, R.; Lanfear, V. W.

110f. Evolution of Economics Society (6 Women, 16 Men). *A (Excellent)* Baker, Rex; Brand, C. E.; Etter, Leslie; Farb, Jacob; Hinds, J. H.; Hunt, Virginia. *B (Good)* Alderson, C. J.; Boone, Lalla; Burg, Elsa; Chiles, R. S.; Denman, Gilbert; DeViny, A. E.; Gray, Sara; Guinn, Gaynell; White, R. C.; Williams, Dan.

116s. Economics of Agriculture (14 Men). *B (Good)* Barnes, W. J.; Chiles, R. S.; Coles, W. E.; Fish, I. Wm.; Sanger, E. L.; Vaughn, G. C.

214ws. The Labor Problem (7 Women, 24 Men). *A (Excellent)* Hinds, J. H.; Howard, Geo. *B (Good)* Alderson, Curtis; Boone, Lalla; Chiles,

R. S.; Etter, Leslie; Gray, Sarah; Guinn, G.; Hudson, H. H.; McGee, David; Potts, Ruth; Scurlock, D. W.; Thompson, E. O.; Brownrigg, T. H.

English

1. Rhetoric and Composition (384 Women, 611 Men). *A (Excellent)* Bailey, J. W.; Boner, C. P.; Boone, Katherine; Chandler, Elizabeth; Chaudoin, Robert; Christenson, Clara; Clabough, Morien; Dupuy, Margaret; Gillen, Ralph; Ulrich, Lydia. *B (Good)* Agee, J. F.; Archer, L. B.; Barker, Owen; Barnett, W. C.; Beall, Jack; Bird, Alice; Black, Hulon; Boone, Emma; Breustedt, Lillian; Cox, Davie; Cox, Walter; Craig, Clifford; Darnell, W. C.; De La Garza, Paul; Ector, Elizabeth; Edman, Grace; Enloe, Olive; Gill, Florence; Glass, Elizabeth; Glover, O. E.; Gordon, Alma; Gowan, Wm.; Greenwade, Fannie; Greer, Lola; Gregory, Lloyd; Hartel, Bernice; Henderson, Adele; Henderson, Mary; Hexter, L. J.; Hickerson, Jack; Hillyer, Blanch; Hogue, Ruth; Jenke, Kathryn; Joiner, Maud; Jones, A. J.; Knickerbocker, Louise; Lamar, Lois; Lancaster, H. E.; Lawler, R. W.; Levy, Edith; Miller, Erin; Morris, Annie; Nance, Grace; Northrup, Preston; Owens, Neva; Pearce, Ella; Rach, Edgar; Rimassa, J. M.; Robertson, Bessie; Ross, Crystal; Ross, Lillian; Rowley, Geo.; Scovell, Sadie; Seymour, Elta; Snaveley, Doris; Stallings, Hope; Stockard, Undine; Toles, Mabel; Trimble, Belle; Von Bose, Max; Wakefield, Audra; Warren, Guy; White, F. J.; Wilkinson, Mamie; Wise, Olivette; Wohlberg, Manuel; Wolflin, Lee; Woodward, Mabel; Wynn, A. T.; Wynne, F.

2. Outline History of English Literature (280 Women, 318 Men). *A (Excellent)* Agnew, Floy; Alvey, Glenn; Beverly, J. R.; Clarke, Frances; Collett, Jeanette; Dameron, Travis; Ellis, Nancy; Gardner, Anna; Hirschfeld, Dorothy; Houston, Bruce; King, Clarence; Knight, R. A.; McDonald, D. B.; Masters, Mildred; Miller, Fidelia; Miller, Virginia; Nelson, Elizabeth; Rowe, Frances; Sykes, Eleanor; Tillery, C. B.; Winslow, Elizabeth. *B (Good)* Akin, J. W.; Allen, Mary Louise; Ashford, Claire; Baker, Leonard; Bergson, Elsie; Boyd, Jence; Bussey, Frances; Carleton, Alma; Carrigan, Evelyn; Cheesborough, Floride; Condron, Ewell; Corbin, Vida; Davis, E. E.; Davis, Mrs. Eugene; Drumwright, McNeill; Edmond, Flora; Elliott, Lloyd; Graham, Nora; Hamer, Anne; Harrell, Dorothy; Harris, Pauline; Hartman, C. F.; Heflin, Alta; Hogaboom, Marion; Jackson, R. D.; Johns, Flora Lee; Jordan, E. M.; Keith, Mabel; Kline, Max; Lancaster, Linda; Little, Harry; McAnnelly, Zora; McKnight, Ethel; Mantor, Mayhew; Meyer, Marguerite; Morford, Elizabeth; Naugle, W. A.; Neville, Mary; Neibuhr, Angela; Notley, Lewellyn; O'Donnell, Annie; Rathbone, Lucy; Rose, Gladys; Sehorn, Chas.; Shelton, D.; Sleeper, Martha; Smith, Nancy; Storey, Corinne; Taylor, Alice; Thomas, Katherine; Watkins, Myrtis; Watson, Winifred; Williams, Helen; Williams, Marguerite; Wiseman, Lydia.

3. English Composition (35 Women, 49 Men). *A (Excellent)* Hirschfield, Dorothy; Smith, Nancy; Watson, Mary. *B (Good)* Bergson,

Elsie; Colbert, Jonnie; Dittmar, Gus; Franke, Helen; Gladney, Mildred; Harris, Pauline; Minor, Elizabeth; Walker, Stanley; Weeks, J. M.

4. Outline History of English Language (13 Women, 6 Men). *A (Excellent)* Bell, Rubie; Russell, R. Pearl. *B (Good)* Durrett, Florence; Stroud, Georgie.

20. Conference Course (1 Woman, 3 Men). *A (Excellent)* Harrison, R. C. *B (Good)* Bell, Rubie.

22. Victorian Poetry (5 Women, 5 Men). *A (Excellent)* Hatch, Josie; McLean, Katherine. *B (Good)* Booth, Jewel; Rogers, Mabel.

31. English Drama From 1660 to Present Time (49 Women, 11 Men). *A (Excellent)* Goldstein, Estelle; Kennedy, Ruth. *B (Good)* Blattner, Mary Anne; Burg, Elsa; Durrett, Florence; Howard, Mildred; Johnson, Gillis; Knight, Henry C.; Maupin, Mary; Shaw, Rex; Shuler, Mary; Wilson, Geraldine.

106s. Milton (24 Women, 20 Men). *A (Excellent)* Foster, Myrtle; Penn, E.; Ward, Josephine. *B (Good)* Coffee, Vera; Duke, L. B.; Huston, Cleburne; Kosanke, Martha; Miller, Gladys; Pearson, DeRugeley; Stroud, Georgia.

108f. The Poetry of the English Classical Period (13 Women, 6 Men). *A (Excellent)* Goldstein, Estelle; Swindells, Virginia. *B (Good)* Barrow, Anna; Berry, Jessie; Borden, Minnie; Gardner, J. H.; Janoch, Helena; Mueschke, Paul; Murphy, Madelene; Robertson, Mary Lee; Rowntree, Gladys.

116s. Modern English Grammar (2 Women, 1 Man). *A (Excellent)* Dobie, Mrs. J. F.

117f. Beginnings of English Grammar (7 Women, 4 Men). *B (Good)* Barlow, Vivian; Robb, T. H.; Wynne, Vivien.

118. English Prose of the Augustan Age (20 Women, 12 Men). *A (Excellent)* Clapp, Sarah; Glover, Estella; Ware, Lois. *B (Good)* Lee, V. P. K.; Morris, Ethel N.; Probandt, Frances; Sloan, Winnie; White, R. C.; Wooten, L. W.

124w. Elizabethan Lyrical Poetry (26 Women, 16 Men). *A (Excellent)* Glover, Estella; McLaughlin, D. W. T.; Molesworth, Kathleen; Probandt, Frances; Sweet, Martha; Ware, Lois. *B (Good)* Bagnall, Blanche; Cleveland, Nellie; Franke, Helen; Harrell, Ruth; Morris, Ethel; Rootes, Virginia; Stell, Bernice; Wilkerson, Clare; White, R. C.

125. English Composition (10 Women, 7 Men). *A (Excellent)* Foster, Alice; Hill, Marian; Raymond, Mrs. Dora. *B (Good)* Bowles, C. E.; Candler, Martha; Gulick, C. C.; Hoit, Dorothea; Ragsdale, S. B.; Williams, Dan; Wilson, Margaret.

126w. The English Drama From 1540 to Shakespeare (16 Women, 15 Men). *A (Excellent)* Edwards, Hazel; McLaughlin, D. W.; Wynne, Vivian. *B (Good)* Elliott, Katherine; Goolsby, John; Hughes, Elizabeth; McClanahan, Allen; Muse, Mary; Sloan, Winnie.

127s. The English Drama From 1600 to 1642 (30 Women, 25 Men). *A (Excellent)* Bostick, Merrie; Edwards, Hazel. *B (Good)* Davidson,

Nan; Hughes, Elizabeth; Murchison, Mary; Murphy, Madeline; Zilker, Pearl.

132s. English Literature for Freshmen (43 Women, 37 Men). *A (Excellent)* Boone, Katherine; Chandler, Elizabeth; Cox, Davie; Gordon, Alma; Owens, Neva; Stockard, Undine; Way, Jean. *B (Good)* Adamson, Ione; Agee, J. F.; Baker, Irma; Boner, C. P.; Clabough, Morien; Cotton, Sara; Crutcher, I. H.; Farrow, Cary; Fred, Gus; Gill, Florence; Hexter, L. J.; Holmig, Madie; Jackson, Fannie; Kerns, Evelyn; Lubben, R.; Milam, Maud; Morriss, Annie; Osmon, Gladys; Robertson, Bessie; Scovell, Sadie; Thatch, Annie; Yeates, Eva.

133. Early Nineteenth Century Prose (27 Women, 12 Men). *A (Excellent)* Boone, Lalla; Glover, Estella; Muse, Mary; Ware, Lois. *B (Good)* Chiles, R. S.; Clayton, Bonnie; Cleveland, Nellie; Cunningham, Ruth; Gross, L. H.; Heimsath, C. H.; Horton, Bertha; Johnson, Gillis; Kennedy, M. F.; Ledbetter, Agnes; Myrick, Margaret; Rootes, Virgina; White, R. C.; Zilker, Pearl.

134. Chaucer (31 Women, 10 Men). *A (Excellent)* Goldstein, Estelle; Kniker, Rosa. *B (Good)* Eikel, Linda; Frank, Helen; Hawkins, Marian; Howard, Mildred; Shuler, Mary; Stullken, Florence; Elizabeth, Andrews.

136s. American Prose (40 Women, 17 Men). *A (Excellent)* Burt, Helen; Davis, Jas.; Davis, Madge; Foster, Myrtle; Glover, Estella; Hall, Ruth; Probandt, Frances; Sewell, Mary. *B (Good)* Berry, Ellavoise; Bigger, V. G.; Davidson, Nan; Dittmar, Gus; Goolsby, J. L.; Harrell, Ruth; Holman, E.; Howell, W. R.; Hume, Winifred; King, Lawrence; Kirk, O. W.; Lee, V. P.; Murphy, Madelene; Potts, Ruth; Renfro, McNulty; Rogers, Mabel; Rootes, Virginia; Rumph, Clarice; Seymour, Cora; Sloan, Winnie; Stell, Bernice; Stephena, Sister; Traeger, Gazelle; Treadwell, W. B.; Wherry, Pauline; Winston, Chas.

205fw. Shakespeare (38 Women, 15 Men). *A (Excellent)* Clapp, Sarah; Hall, Ruth; Hatch, Josie; Russell, Pearl. *B (Good)* Bassell, Annie; Colbert, Jonnie; Gillett, R. W.; Lovelace, Marie; McLean, Katherine; Potts, Ruth; Stroud, Georgia; Trice, L. B.

209ws. The English Romantic Movement (32 Women, 16 Men). *A (Excellent)* Burke, Mary E.; Clapp, Sarah; Triplett, Granville; Young, Jeffie. *B (Good)* Barlow, Vivian; Barrow, Anna; Borden, Minnie; Dobie, S. N.; Gardner, J. H.; McLaughlin, D. W.; Robinson, Annie; Sweet, Martha.

211fw. American Poetry (26 Women, 7 Men). *A (Excellent)* Glover, Estella; Hall, Ruth; Hatch, Josie; Potts, Ruth; Segal, Rosebud. *B (Good)* Davis, Madge; Dittmar, G.; Foster, Myrtle; Hume, Winifred; Kirk, Ohmer; Knox, Leona; Sewell, Mary; Sloan, Winnie; Stephana, Sister.

215 fw. Middle English (1 Woman, 1 Man). *A (Excellent)* Dobie, Mrs. J. F.

235fw. Contemporary English Poetry and Recent English Novel (51 Women, 10 Men). *A (Excellent)* Dobie, Mrs. J. F.; Feuille,

Estelle; Field, R. M.; Goldstein, Estelle. *B (Good)* Barnes, Maud; Bell, Florence; Bumpass, Elise; Howard, Mildred; Knight, H. C.; McCammon, Matilda; Meade, Gertrude; Muse, Mary Grace; Ousley, Clare; Pierce, Mary.

French

A. Composition and Reading (125 Women, 76 Men). *A (Excellent)* Crager, Jay; Edmond, Flora; Flack, Dora; Hume, Winifred; Joiner, Maud; Miller, Fidelia. *B (Good)* Amstater, Margaret; Baldwin, M. A.; Booth, Viva; Borden, Minnie; Burke, Mary; Chapa, Concha; Hamer, Annie; Hatchcock, L.; Hill, Mary; Hudson, Louise; McDonald, Amanda; McNelly, Maud; Stroud, Frances; Tharp, Benjamin; Thomason, Ione; Trimble, Belle; Wills, Virginia.

1. Composition and Reading (75 Women, 25 Men). *A (Excellent)* Gordon, Alma; Haynes, Randolph. *B (Good)* Boone, Geraldine; Cartledge, Elizabeth; Knight, Richard; Lamar, Lois; McCullough, Flora; McDaniel, M.; Russell, Peal; Sewell, Mary; Sweet, Martha; Trenckman, Elsa.

2. Composition, Reading, Literature (57 Women, 19 Men). *A (Excellent)* Booth, Jewel; Davis, Madge; Feuille, Estelle; Muse, Grace. *B (Good)* Baker, Viola; Collett, Jeanette; Funlay, Amanda; Hatch, Josie; Nelson, Elizabeth; Peareson, Derugeley; Potts, Ruth; Sleeper, Martha; Stewart, Margaret; Thompson, Mary; Walker, Frances; Ward, Nancy.

11. Nineteenth Century Lyric Poetry (12 Women, 1 Man). *A (Excellent)* Moore, Christie. *B (Good)* Johnson, Ruth; Leary, Verna; Miller, Virgina; Nichols, Ethel; Tripplett, G. B.; Zilker, Pearl.

17. Phonetics and History of French Languaue (11 Women, 1 Man). *B (Good)* Charles, Myrtle; Goldstein, Estelle; Hirschfield, Dorothy.

18. French Literature of Eighteenth and Nineteenth Centuries (17 Women, 1 Man). *A (Excellent)* Charles, Myrtle; Goldstein, Estelle. *B (Good)* Hirshfield, Dorothy; Meade, Gertrude.

20. Old French (1 Woman). *A (Excellent)* Woodbridge, Elizabeth.

General Literature

1. Tragedy (75 Women, 11 Men). *A (Excellent)* Shuler, Mary. *B (Good)* Durrett, Florence; Fitzwilliams, Grace; Hawkins, Marion; Johnson, Irma; Leary, Verne; Lohman, Irene; Mobley, Helen; Morris, Ethel; Muse, Grace; Renick, Dorothy; Trenckman, Else; Trice, Lois.

9. The Epic (24 Women, 5 Men). *B (Good)* Boothe, Viva; Bufkin, H. M.; Coffee, Ollie; Franklin, Mary Louise; Leary, Verna; Morris, Ethel; Peareson, De Rugely; Robinson, Annie; Sewell, Mary; Stewart, Margaret.

Geology

1. General Geology (101 Women, 162 Men). *A (Excellent)* Amstater, Margaret; Bailey, Claude; Clayton, Bonnie; Goodman, Henry; Livingston, H. R.; Sehorn, Edwin; Shuler, Mary; Simonds, A. W. *B (Good)* Bailey, J. W.; Beasley, Guy; Beavers, Dorothy; Berry, Jessie; Beverly J. R.; Boone, Kathleen; Braswell, Carrie; Bussey, Frances; Carleton, Alma; Cheesteen, G. D.; Christner, Drue; Condron, Ewell; Coor, Minnie; Eberle, Hulda; Edmond, Flora; Franke, Helen; Gardner, Anna; Gill, Florence; Greer, S. M.; Hartman, H. W.; Hatchcock; Louise; Hawkins, Marian; Heare, W. C.; Hightower, Vernon; Hunter, J. A.; Johnson, J. E.; Jurcak, Vlaska; Kelly, Hallie; Kennedy, Earl; McCurdy, Margaret; McGregor, J. H.; McNelly, Maud; McKnight, Ethel; Mantor, M.; Miller, Vernon; Miller, Horace; Nance, Charlotte; Neblett, B. M.; Notley, Llewlyn; Phillips, Nelson; Pressler, E. E.; Rumsey, Delia; Russ, A. E.; Sears, Florence; Shelton, D. M.; Shields, J. H.; Street, Lucile; Symonds, W. R.; Terry, C. L.; Warren, W. F.; Weeks, J. E.; White, F. J.; Williams, Fleta; Wood, A. G.; Wynne, Vivian; Yeates, Eva.

2. Historical Geology (7 Men). *B (Good)* Holman, Eugene; Lang, A.; McFarland, La Rue; Waits, Homer.

7. Special and Advanced Geology (4 Men). *B (Good)* Gatlin, Tom; Trask, Parker.

12. Physiography of North America (7 Men). *B (Good)* Lang, A.; Macatee, G. P.; Penn, Albert; Thomas, Milton.

14. Paleontology (2 Men). *B (Good)* Damon, S. E.

16. Mineralogy (2 Men). *B (Good)* Mantor, M.; Rose, E. A.

23. Paleontology (1 Woman, 1 Man). *A (Excellent)* Benson, Amelia. *B (Good)* Keeble, Don.

24. Economic Geology (3 Men). *A (Excellent)* Ellingwood, F. F. *B (Good)* Holman, Eugene.

27. Field Geology (5 Men). *A (Excellent)* Crook, T. H.

30. Paleontological Research (2 Women, 1 Man). *A (Excellent)* Kniker, H. T.; Trask, P. D. *B (Good)* Ellisor, A. C.

German

A. Beginners' German (70 Women, 174 Men). *A (Excellent)* Berg son, Elsie; Boner, C. P.; Copeland, Mary; Fred, G. B.; Heflin, Alta; Pearce, Dewey; Robertson, L. H.; Weatherby, Sara; Winston, C. J. *B (Good)* Barnett, W. C.; Crawford, Jessie; Dewey, Mary; Gowan, W. C.; Greer, Lola; Gross, O. W.; Gulick, C. A.; Hazel, G. C.; Humphries, J. T.; Kelly, S. F.; Leake, L. B.; Monger, N. D.; Poindexter, C. M.; Rosenstein, F. A.; Seymour, E. C.; Smith, Nancy; Stocking, Ruth; Street, Lucile; Vinson, Maudell; Walker, E. J.; Williams, Lester; Williams, O. B.; Womack, R. H.

1. Composition and Reading (71 Women, 130 Men). *A (Excellent)*

Dunlay, Amanda; Jonas, Richard; Masters, Mildred; Taylor, R. S. *B (Good)* Agnew, Floyd; Ardis, Gladys; Bailey, Claude; Bering, Norman; Brown, Oscar; Cottingham, Eliza; Enloe, Olive; Hight, Joe; Kline, M. O.; Knight, Arley; Martin, F.; Martinson, L. M.; Preddy, J. R.; Sandstrom, Oscar; Strack, Emma.

2. Rapid Reading Course (54 Women, 53 Men). *A (Excellent)* Hirshfield, Dorothy; Hollmig, Madie; Newman, Rose; Ullrich, Lydia; Wynne, Vivian. *B (Good)* Breustedt, Lillian; Franklin, Louise; Glass, Elizabeth; Gore, A. L.; Kangerga, Alecia; Lee, Virgil; Lovett, Mary; Mantor, M.; Mood, Jennie; Rucker, G. M.; Tillery, C. B.; Warren, Stella.

8. Schiller (6 Women, 3 Men). *A (Excellent)* Knicker, Hedwig; Knicker, Rosa. *B (Good)* Hegar, Joseph; Kuehne, Helen; Ullrich, Oscar.

11. Outline of German Literature (26 Women, 4 Men). *A (Excellent)* Eikel, Linda; Knight, O.; Kosanke, Martha; Trenckmann, Else; Stullken, Florence. *B (Good)* Foster, Alice; Franke, Helen; Giesecke, Alma; Kirk, O. W.; Trenckmann, Clara; Zihlman, Agnes.

22. German. *A (Excellent)* Rabke, R. F.; Rogers, Elinor; *B (Good)* Baker, Rex; Boog, J. C.; Haynes, Randolph; Miller, J. D.; Sweet, Martha; Ulrich, C.; Wranitzky, A.

31. Seminary in Germanic Philology (2 Women, 1 Man). *A .Excellent)* Kniker, Rosa. *B (Good)* Renken, Bertha.

105. Colloquial Exercises (6 Women, 3 Men). *A (Excellent)* Kangerga, Alecia. *B (Good)* Doggett, W. C.; Wellborn, Eugenia.

120. Grammar Review (8 Women, 4 Men). *A (Excellent)* Niebuhr, Angela; Wacker, A. J.; Zihlman, Agnes. *B (Good)* Koch, Lena; Rootes, Virginia; Stiefel, D. M.

122. Phonetics (3 Women, 4 Men). *A (Excellent)* Hegar, J.; Karbach, Olivia; Kirk, O.; Saverio, E. *B (Good)* Janoch, Helen; Mueschke, P.; Zilhman, Agnes.

128. Introduction to German Philology (9 Women, 1 Man). *B (Good)* Janoch, Lillian; Trenckman, Else; Kniker, Rosa.

124. Historical German Grammar (3 Women, 4 Men). *A (Excellent)* Hegar, Joseph; Karbach, Olivia; Kirk, O. W. *B (Good)* Janoch, Lillian; Zihlman, Agnes.

126f. Gothic (3 Women, 1 Man). *A (Excellent)* Kniker, Rosa; Kuehne, Helen; Renken, Bertha. *B (Good)* Knizek, Charles.

127w. Old High German (3 Women, 1 Man). *A (Excellent)* Kniker, Rosa; Renken, Bertha. *B (Good)* Knizek, Chas.; Kuehne, Helen.

130s. Advanced Old High German (3 Women, 1 Man). *A (Excellent)* Kniker, Rosa; Knizek, Chas. *B (Good)* Kuehne, Helen.

220. Advanced Practice (10 Women, 5 Men). *A (Excellent)* Eikel, Linda; Niehbuhr, Angela. *B (Good)* Kirk, O.

Government

1. Introduction to Government (18 Women, 106 Men). *A (Excellent)* Field, R. M; King, C. H.; Lohman, Irene. *B (Good)* Beverly, J. R.; Foster, Lois; Glover, Estella; Gulick, C. C.; Guthrie, R. W.; Haynes, F. E.; Haynes, R. A.; Howell, W. R.; Huffman, R. R.; Jackson, R. D.; Patterson, V. R.; Robb, T. H.; Shield, J. H.; Trask, P. D.

4. Government (5 Women, 106 Men). *A (Excellent)* Corenbleta, E.; Lewis, Mrs. B. M.; Topletz, L. *B (Good)* Bradley, C. P.; Davis, A.; Elfenbein, J. S.; Greer, J. M.; Guinn, G. C.; Jacks, N.; Laird, J. A.; Martin, F.; Montague, J.; Moore, L. M.; Murphy, E. T.; Nelson, E. C.; Scharff, L. L.; Scurry, T.; Sheehy, J. F.; Simmons, D. A.; Smith, H. S.; Spiller, H.; Stinnett, M.; Trimble, R. R.; Whitfield, R.

15. Comparative Municipal Government (4 Women, 15 Men). *B (Good)* Barnes, J. A.; Boles, J. L.; Broadfoot, Virginia; Glithero, J.; Hopkins, Maury; Howard, George; Holt, Birge; Knight, Otis; Priest, R. R.; Sherrill, H. L.

18. Municipal Administration (2 Men). No honors.

20. Comparative Constitutional Law (5 Men). *A (Excellent)* Brame, M. S. *B (Good)* Felgar, R. P.; Livingston, H. R.; McArthur, D. E.; Neff, F. A.

21. Public Finance (3 Men). No honors.

22. State Government (2 Women, 14 Men). *A (Excellent)* Parten, J. R.; Stewart, F. M.; Watkins, L. *B (Good)* Frame, M. S.; Butler, W. H.; Broadfoot, Virginia; Croley, J. L.; Hartson, A. B.; Hillman, E. G.; Speer, P. A.; Walker, F. E.

24. Governments of Foreign Countries (3 Men. No honors.

27. Comparative Government (4 Men). *A (Excellent)* Byers, J. H.; Brame, M. S.; O'Donnell, W. C.; Stewart, F. M.

119ws. Municipal Research Methods (1 Man). *A (Excellent)* Neff, F. A.

123. American Diplomacy (2 Men). *B (Good)* Alderson, C. J.; Parten, J. R.

Greek

22. Attic Prose (6 Women, 5 Men). *A (Excellent)* Masters, Mildred; Ware, Lois. *B (Good)* Davidson, Nan.

24. The Beginnings of Poetry and Prose (4 Women, 2 Men). *A (Excellent)* Norman, Hilda. *B (Good)* Baen, Mary; Glover, Estella; Green, Mary; Winston, C. K.

25. Development of Poetry (1 Woman, 3 Men). *A (Excellent)* Green, Mary; Reed, William.

31. Advanced New Testament Greek (2 Men). *B (Good)* Hegar, Joseph; Reed, Wm.

32. Homer (2 Men). No honors.

40. Greek Poetry in English Translation (15 Women, 5 Men). *A (Excellent)* Myrick, Margaret. *B (Good)* Bassell, Annie; Buddy, Elizabeth; Faust, C. G.; Howard, Mildred; Knight, H. C.; Ragland, C. M.; Reynolds, Ewing; Rucker, Martha; Withers, Mattie.

123. Greek Composition (1 Woman, 2 Men). *B (Good)* Davidson, Nan.

199s. Greek in English (21 Women, 18 Men). *A (Excellent)* Dameron, Travis; James, Bessie; Kelper, Dorothy; Wulf, R. G. *B (Good)* Clark, Margaret; Cunningham, Frances; Heflin, Alta; Horton, Bertha; Knight, M. A.; Rose, Gladys.

521. Beginners' Greek (22 Women, 15 Men). *A (Excellent)* Kern, Mildred; Odgers, Olivia; Wier, Lottie. *B (Good)* Agee, J. F.; Carrington, Evelyn; Gardner, Anna; Gillen, R. K.; Newton, C. E.; Stockard, Undine.

History

1. Ancient History (59 Women, 35 Men). *B (Good)* Corbin, Vida; Curry, Mary; Hearne, Irene; Johnson, Tommie; Jonas, Richard; Savage, Georgie; Tuttle, Caroline.

2. History of Medieval Europe (126 Women, 146 Men). *A (Excellent)* Chapa, Concha; Clarke, Frances; Hexter, L. J.; Moss, Joseph; Owens, Neva. *B (Good)* Atkinson, Eleanor; Barnett, W. C.; Boone, Katherine; Burrell, Julia; Cartledge, Elizabeth; Carleton, Alma; Chovanetz, Charles; Cass, Florence; Edman, Grace; Harrell, Dorothy; Henderson, Adele; Henderson, Mary; Hollmig, Madie; Howard, W. C.; Maltby, Mary; McCurdy, Elizabeth; Miller, Erin; Newell, Mary; Nickell, Helen; Pierce, Madge; Preddy, J. R.; Reeder, Lena; Rhea, Lawrence; Rimassa, J. M.; Rucker, Francis; Russell, J. H.; Stroud, Frances, Way, Jean; Wills, Virginia; Wilkinson, Annie; Wolfin, Lee.

3. History of Modern Continental Europe (34 Women, 20 Men). *A (Excellent)* Frank, Pauline; Winslow, Betty. *B (Good)* Batten, R. K.; Broadfoot, Virginia; Coor, M.; Crow, Louise; Cunningham, O. Ruth; Foster, Lois; Franke, H. L.; Gladney, Mildred; Hogue, Sammy; McCammon, Tillie; Martin, Lillian; Miller, Virginia; Rose, Gladys; Taylor, H. M.; Winston, C. J.

4. History of England (24 Women, 18 Men). *A (Excellent)* Rose, Gladys. *B (Good)* Condron, E. D.; Franklin, Mary; Goodman, H. H.; Knox, Leona; Kosanke, Martha; Patterson, V. R.; Saenz, Daniel; Smith, Nancy.

5. History of the United States (61 Women, 89 Men). *A (Excellent)* Alvey, Glenn; Blattner, Mary Anne; King, C. H. *B (Good)* Dameron, Travis; Edwards, Hazel; Heimsath, Chas.; Knight, R.; Nami, H. G.; Taylor, Alice; Williams, Helen; Williams, Rosamond.

7. The Anglo-American Southwest (3 Women, 3 Men). *A (Excellent)* Calhoun, T. J.; Christian, Asa.

8. Later United States History (2 Women, 5 Men). *A (Excellent)* Felgar, J.

23. History of Continental Europe Since 1815 (11 Women, 11 Men). *A (Excellent)* Hatch, Josie; Wacker, A. J.; Walker, F. E. *B (Good)* Charles, Myrtle; Gulick, C. A.; Ledbetter, Agnes; Maupin, Mary; Pope, F. S.; Zilker, J. P.

25. History of the United States, 1750-1829 (10 Women, 14 Men). *A (Excellent)* Christian, Asa; Norton, F. E.; Stewart, F. M. *B (Good)* Davis, L. B.; Dittmar, Gus; Waterston, Elizabeth.

31. Greek Imperialism (6 Women, 3 Men). *A (Excellent)* Field, R. M.; Mobley, Helen. *B (Good)* Coffee, Vera; Hawkins, Marion; Wipprecht, Welch.

34. The British Empire (7 Women, 12 Men). *A (Excellent)* Durrett, Florence. *B (Good)* Caldwell, R. H.; Hartman, C. F.; Hartman, G. A.; Jordt, E. B.; Sehorn, Edwin.

35. History of the United States, 1829-1860 (18 Women, 29 Men). *A (Excellent)* Dittmar, Gus; Gulick, C. C.; Mobley, Helen. *B (Good)* Boone, Lalla; Brame, M. S.; Butler, W. H.; Davis, L. B.; Gray, Sarah; Guinn, Gaynell; Hartman, G. A.; Scott, L. A.; Sloan, Sallie; Swindells, Virginia; Wacker, A. J.; Waterston, Elizabeth; Whittaker, Bertha; Young, Jeffie.

36. The Spanish Southwest (3 Women, 1 Man). *B (Good)* Camp, Carrie; Swindells, Virginia.

45. The Civil War and Reconstruction (11 Women, 9 Men). *A (Excellent)* Boone, Lalla. *B (Good)* Cox, R. D.

46. History of Latin America (11 Women, 9 Men). *A (Excellent)* Brame, M. S. *B (Good)* Wilkinson, Anne.

64. English Diplomatic History (6 Women, 9 Men). *A (Excellent)* Lohmann, Irene; Raymond, Mrs. Dora. *B (Good)* Caldwell, R. H.; Charles, Myrtle; Platt, Hazel; Sehorn, Edwin; Watkins, Leonard.

74. History of England (91 Women, 146 Men). *A (Excellent)* Gracy, Berty; Inserillo, L. R.; Miller, Joseph. *B (Good)* Ardis, Gladys; Bailey, J. W.; Barker, Owen; Brown, O. F.; Carpenter, O.; Eidson, J. A.; Farrow, Cary; Glass, Ross; Greenspun, J. M.; Henderson, Geo.; Hickerson, J. D.; Knickerbocker, Louise; Lacy, Stena; Link, R. L.; Nance, Grace; Rach, E. C.; Rumsey, Delia; Sandstrom, O. W.; Stephenson, Cecelia; Strasburger, H. W.; Tyler, Ruth; Urbantke, Elsie; Waghalter, A. E.; Ward, Margaret; Wheeler, Orby; White, F. J.; Wohlberg, Manuel.

142 s. The Beginnings of the Renaissance (10 Women, 7 Men). *A (Excellent)* Bostick, Merrie; Hatch, Josie; James, Bessie. *B (Good)* Broadfoot, Ellie; Carlowitz, Hans; Clayton, Bennie; Dunlap, Inez; Graham, Agnes; Koch, Lena; Townsend, Hester.

226. Spanish and French Colonization in United States (3 Women, 2 Men). *B (Good)* Heflin, Alta; Renick, Dorothy; Wueste, Fern.

231. Medieval Society (7 Women, 11 Men). *A (Excellent)* Calhoun, T. J. *B (Good)* Carlowitz, Hans; Fish, Ferris; Graham, Agnes; Guthrie, R. W.; Knight, R. A.; Rice, Nancy.

Home Economics

1. Introductory Course (80 Women). *A (Excellent)* O'Donnell, Annie; Winn, Afton. *B (Good)* Abernathy, Maidette; Buice, Mrs.; Carl, Alma; Drow, Vera; Greene, Frances; Gunter, Emma; Hardison, Fannie; Jackson, Katie; Jones, Nell; McKinney, Pauline; Myrick, Margaret; Rathbone, Lucy; Rice, Emily; Robertson, Grace; Ross, Cecilie; Ross, Crystal; Roundtree, Mary; Skeeler, Annie; Skiles, Leta; Trenckman, Clara; Wherry, Pauline; Williams, Marguerite; Winn, Nannie.

8. Food Preparation (8 Women). *B (Good)* Berry, Elavoise; Peareson, Margaret; Pinckney, Jeanie; Spence, Charlotte.

11. Food Composition and Digestion (14 Women). *A (Excellent)* Knippa, Hilda. *B (Good)* Berry, Ellavoise; Byrd, Alice; Harrell, Ruth; Welborne, Eugenia.

15. The Manufacture and Selection of Clothing (36 Women). *A (Excellent)* Berry, Ellavoise; Doran, Agnes; Rathbone, Lucy. *B (Good)* Andrews, Elizabeth; Bagnall, Blanche; Bonner, Lena; Browne, Celeste; Buice, Mrs. Mary; Gillespie, Martha; Knippa, Hilda; Lanier, Ethel; Lovett, Edna; Myrick, Margaret; Nichols, Ethel; Robison, Kittie; Ross, Cecile; Rummell, Sidonia; Stayton, Annie; Townsend, Hester; Whitehouse, Eula; Woodley, Opal.

113 s. Nutrition (3 Women). *B (Good)* Peareson, Margaret; Stayton, Anna; Works, Belle.

114. Art Principles and Appreciation (36 Women). *A (Excellent)* Cunningham, Mrs. M.; O'Donnell, Annie. *B (Good)* Bagnall, Helen; Carleton, Alma; Corbin, Vida; Dawson, Cordelia; Fitzwilliams, Grace; Howard, Mildred; Janoch, Helena; Ledbetter, Agnes; Williams, Helen.

204 fw. House Structure and Sanitation (29 Women). *A (Excellent)* O'Donnell, Annie. *B (Good)* Cunningham, Frances; Ledbetter, Agnes; Myrick, May; Reynolds, Ewing; Woodley, Opal.

211 ws. Home Economics (9 Women). *A (Excellent)* Maupin, Marie. *B (Good)* Field, Bernadine.

212 fw. Dietetics (3 Women). *B (Good)* Peareson, Margaret; Stayton, Annie; Works, Belle.

216fw. Design. (17 Women). *A (Excellent)* Holt, Dorothea. *B (Good)* Berry, E.; Byrd, Alice; Harrison, Mrs. W. W.; Holmes, Cora; Megee, Louise; Woodey, Opal.

217 fw. Costume (7 Women). *A (Excellent)* Berry, Ellavoise; Byrd, Alice; Harrison, Mrs. *B (Good)* Harlan, Sarah; Megee, Louise; Rootes, Virginia.

Institutional History

1. Elements of Institutional History (31 Women, 13 Men). *A (Excellent)* Calhoun, T. J.; Davis, Mrs. E.; Wooten, Lynn; Wueste, Lillian Fern. *B (Good)* Barlow, Vivian; Bass, Bessie; Black, Grover; Cunningham, Mrs. F. H.; Dittmar, Gustave; John, Marguerite; Parsons.

E. B.; Randolph, Dorothy; Rowe, Frances; Rucker, Martha; Spence, Virginia; Watson, Mary.

2. The Geography of Eastern Civilization (7 Women, 5 Men). *A (Excellent)* Glenny, Joe; Shelton, Mary. *B (Good)* Crow, Louise; McLean, Roy; Massie, George; Mears, Merle; Miller, Alice; Stacy, Harwood; Young, Louise.

7. The Science of Civilization (4 Men). *B (Good)* Glenny, Joe.

Italian

1. Composition and Reading (11 Women, 2 Men). *A (Excellent)* Bagnall, Helen; Daniel, Camill; Goldstein, Estella. *B (Good)* Allen, Mary; McKinstry, Nellie; Moore, Christie; Wooten, Lynn.

Journalism

1. History and Principals of Journalism (20 Women, 14 Men). *A (Excellent)* Evans, H. C. *B (Good)* Anderson, Stella; Elliott, Katherine; Ellis, Jno.; Ellis, Nancy; Gillett, R. W.; Northrup, P. G.

2. Comparative Journalism (1 Woman). *A (Excellent)* Miller, Ada.

12. News Gathering (10 Women, 10 Men). *A (Excellent)* Evans, H. C. *B (Good)* Anderson, Stella; Cox, R. D.; Ellis, Jno.; Hudson, Sophia; Northrup, P. C.; Renick, Dorothy; Treadwell, W. B.

14. Copy Reading (3 Women, 2 Men). *A (Excellent)* Evans, H. C.

15. Editorial Writing (5 Women, 4 Men). *A (Excellent)* Evans, H. C.; Ragsdale, S. B.; Watson, Adele.

16. Newspaper Technic (3 Women). *B (Good)* Miller, Ada; Wilson, Geraldine.

22. Principles and Technic of Advertising (4 Women, 7 Men). *B (Good)* Booth, Viva; Hill, Marian; Hudson, H. H.

23. Business Management (1 Woman). *A (Excellent)* Miller, Ada.

31. The Mechanics of Printing (1 Woman, 7 Men). *B (Good)* Moore, C. L.

103. Newspaper Jurisprudence (3 Women, 3 Men). *A (Excellent)* Miller, Ada. *B (Good)* Anderson, Stella; Ragsdale, S. B.

216 ws. Magazine Making (6 Women, 4 Men). *A (Excellent)* Hogue, Sammy; Watson, Adele. *B (Good)* Hill, Marian; Richardson, I. B.

219 ws. Feature Writing (4 Women, 1 Man). *A (Excellent)* Miller, Ada.

Latin

3. Reading Course (50 Women, 22 Men). *A (Excellent)* Curry, W. N.; Knight, Otis. *B (Good)* Carrington, Evelyn; Corbin, Vida; Curry, Mary; Garner, J. T.; Keith, Mabel; Kern, Mildred; Lightfoot, Grace; McDonald, D. B.; Miller, Beatrice; Smith, Margaret; Smith, Nancy; Stell, J. T.; Toles, Mabel; Whitehouse, Eula.

5. Reading Course (13 Women, 8 Men). *A (Excellent)* Masters,

Mildred; McLean, Katherine; Russell, Pearl. *B (Good)* Barlow, Vivian; Faust, C. G.; Hegar, J.; Odjers, Olivia; Robb, T. H.; Weeks, J. C.

8. Reading Course (8 Women, 3 Men). *A (Excellent)* Glover, Estella. *B (Good)* Ware, Lois.

102. f. Writing Course (12 Women, 5 Men). *A (Excellent)* Booth, Jewel; Garner, Turner; Toles, Mabel.

104. Writing Course (20 Women, 4 Men). *A (Excellent)* McLean, Katherine; Wooten, Lynn. *B (Good)* Corbin, Vida; Kern, Mildred; Lightfoot, Grace; Miller, Beatrice; Smith, Margaret; Stockard, Undine; Toles, Mabel.

106. Composition and Style (5 Women, 2 Men). *B (Good)* Baen, Mary; Glover, Estella; Odgers, Olivia; Russell, Pearl.

109. Composition and Style (2 Women). *B (Good)* Ware, Lois.

215. Advanced Sanskrit (2 Men). No honors.

401. Easy Reading Course (51 Women, 27 Men). *A (Excellent)* Chandler, Elizabeth; DuPuy, Margaret; Greer, Lola; Ullrich, Lydia; Way, Jean. *B (Good)* Agee, J. F.; Boog, J. C.; Cabbiness, Sara; Christensen, Clara; Gillen, Ralph; Gregory, Lloyd; Hill, Mary; Johnson, Gillis; Lanier, Mary; Osmon, Gladys; Tuttle, Carolyn; Wakefield, Audra.

Mathematics

1 a. Plane Trigonometry (275 Women, 379 Men). *A (Excellent)* Agnew, Floy; Anderson, Scott; Bailey, J. W.; Barrow, Alice; Bonner, C. P.; Boog, J. C.; Bowden, Daisy; Bussey, Florence; Campbell, Irma; Chapa, Concha; Childress, Lady; Dockery, Merle; DuPuy, Margaret; Edman, Grace; Eikel, Linda; English, Dudley; Enloe, Olive; Fred, G. B.; Gill, Florence; Gracey, Mary; Greenwade, F.; Hamill, D. B.; Hearne, Irene; Hickerson, J. D.; Hill, W. H.; Howle, Ruth; Joekel, C. L.; Joiner, Maud; Kilgore, M.; Kline, Max; Link, R. L.; Lubben, R.; Miller, J. D.; Nelson, Elizabeth; Peterson, Edwin; Phillip, Nelson; Porter, Autry; Rimassa, J. M.; Robertson, L. H.; Rubio, J.; Sadler, W. T.; Sandstrom, O. W.; Savage, Georgie; Seymour, E. C.; Waghalter, Abner; Wohlberg, M.; Wolflin, Lee. *B (Good)* Ables, Mamie; Agee, H. F.; Anderson, Norma; Bancroft, W. C.; Barrow, L. T.; Barry, R.; Bass, F. R.; Bates, Ella; Bechtel, Josephine; Biggers, D. C.; Blohm, G. A.; Breustedt, Lillian; Browne, Theron; Burton, E. W.; Cardwell, Alma; Carter, Frances; Cave, F. E.; Chenault, A. R.; Crutcher, Isaac; Day, Garland; Dimmitt, J. L.; Dodson, F. C.; Donathan, Wiley; Elledge, Vernon; Field, J.; Fisher, Louise; Gillen, Ralph; Glass, Elizabeth; Greer, Lola; Hamilton, L. E.; Harrell, David; Haynes, R. A.; Henry, H. B.; Hill, Mary; Hogaboom, Marian; Humphries, J. T.; Inserillo, L. R.; Jolley, Geo.; Jonas, R.; Jones, A. J. J.; Kennedy, Earl; Kilfoyle, Mary; Knowles, Margaret; Lancaster, H. E.; Lynn, J.; McCullough, G. A.; McFarlane, B.; Martin, G. D.; Meyer, Louise; Moore, J. B.; Moseley, J. A. R.; Naugle, W. A.; Pearce, M.; Peek, S. M.; Robinson, W. C.; Ross, A. A.; Ross, Crystal; Roth, Magdalene; Seale, J. H.;

Snaveley, Doris; Spears, Vera; Stalling, Hope; Taylor, R.; Taylor, W. C.; Turner, P. A.; Ullrich, Lydia; Waltmore, D. W.; Ward, Margaret; Williams, L. W.; Winston, C. J.; Wolens, L.; Woodson, L. H.; Yarbrough, Minnie.

1b. Advanced Algebra (190 Women, 297 Men). *A (Excellent)* Anderson, Scott; Bailey, J. W.; Bates, Ethel; Burrell, Julia; Chandler, Elizabeth; DuPuy, Margaret; Edman, Grace; Eikel, Linda; Elledge, Vernon; Garner, J. T.; Gracy, Mary; Hearne, Lillian; Henderson, Adele; Henderson, Mary; Henry, H. B.; Hickerson, J. D.; Humphries, J. T.; Joekel, C. L.; Joiner, Maud; Jones, Margaret; Jurcak, Vlasta; Lamar, Lois; Middlebrook, Hattie; Miller, Erin; Morton, Egra; Naugle, W. A.; Newton, Guy; Price, Ralph; Rach, Edgar; Robertson, L. H.; Ross, J. W.; Russell, J. H.; Sadler, W. T.; Savage, Georgia; Seymour, E. C.; Turner, P. A.; Williams, L. W.; Wilson, F. M.; Wright, Thelma. *B (Good)* Abernathy, Maidette; Able, Mamie; Agnew, Floy; Armstrong, Margaret; Armstrong, Mary; Barnett, W. C.; Barrow, L. T.; Bass, G. A.; Beall, Jack; Becker, Hugo; Breustedt, Lillian; Brown, W. W.; Burke, Audrey; Cadena, F.; Cardwell, Alma; Cartledge, Elizabeth; Chaudoin, Roberta; Christner, Drue; DeLaGarza, P.; Douglas, Mrs. V. C.; Duckworth, I. L.; DuMars, J. L.; Field, Z.; Fisher, Louise; Franke, Helen; Freeman, Ross; Frederick, V.; Gill, Florence; Greer, Lola; Guinn, Mabel; Hamill, D. B.; Heath. B. C.; Higginbotham, R. W.; Hill, Mary; Hudson, Louise; Inserillo, F. R.; Johnson, Tommie; Jolley, G. C.; Jones, A. J.; Kallus, E. J.; Lancaster, H. E.; Leake, L. B.; Link, R.; Loggins, J. B.; Lowrey, L. G.; McFarlane, B P.; McKay, J. A.; Meadows, G. T. H.; Meyer, Susette; Miller, Merle; Miles, Vernon; Niebuhr, Angela; Ory, L. K.; Owen, Neva; Pearce, Ella; Poindexter, Cary; Preddy, J. R.; Rabke, R. F.; Reeder, Ruth; Rimassa, J. M.; Robison, W. C.; Rogers, Elinor; Ross, A. A.; Ross, Crystal; Ross, Lillian; Sanders, Seth; Sprain, Minnie; Stephenson, Cecelia; Stockard, Undine; Stringer, Leslie; Timm, Julia; Toles, Mabel; Trimble, Belle; Vernon, Jno.; Ward, Virginia; Welch, Mrs. Etta; White, T. J.; Wilkinson, Annie; Wilson, Lillian; Winston, C. J.; Wulff, R.; Wupperman, Wm.

1 c. Introduction to Analytical Geometry (190 Women, 297 Men). *A (Excellent)* Abernathy, Maidette; Able, Mable; Adair, Octavia; Agnew, Floy; Bailey, G. W.; Barnett, W. C.; Biggers, D. C.; Burrell, Julia; Cartledge, Elizabeth; Chandler, Elizabeth; DuPuy, Mary; Edman, Grace; Eikel, Linda; Elledge, Vernon; Garner, G. T.; Gracey, Mary; Hammill, D. B.; Hickerson, Mary; Hightower, Frank; Hudson, Louise; Joekel, Lillian; Joiner, Maud; Jolley, G. C.; Jones, Margaret; Jurcak, Vlasta; Lamar, Lois; Link, Robert; Lowrey, L. G.; Meyer, Arthur; Middlebrook, Hattie; Morton, Egra; Naugle, W. A.; Poindexter, Cary; Preddy, J. R.; Robertson, L. H.; Ross, Lillian; Savage, Georgie; Seymour, E. C.; Stallings, Hope; Ward, Virginia; Wright, Thelma. *B (Good)* Allen, C. R.; Armstrong, Mary; Anderson, Scott; Barrow, Leon; Bass, F. R.; Bates, Ethel; Bell, Major; Blohm, J. A.; Breustedt, Lillian;

Browne, Theron; Burke, Audrey; Childress, Ladye; Cothingham, Eliza; Crockett, L. O.; DeLaGarza, Paul; Dimmitt, J. L.; Dinwiddie, W. L.; Dockery, Merle; Douglas, Mrs. V. C.; Duckworth, I. L.; Eidson, J. A.; Field, Zatella; Fischer, Louise; Freeman, Ross; Gill, Florence; Glass, Elizabeth; Granberry, R. G.; Harding, M. M.; Hearne, Irene; Henderson, Adele; Henry, H. B.; Hickerson, J. D.; Hill, L. E.; Hill, Mary; Howard, Will; Inserillo, L. R.; Jones, A. T.; Junkin, Fred; Kemper, W. L.; Knowles, Margaret; Lawrence, B. A.; Leake, L. B.; Levy, Edith; McCullar, G. F.; McDonald, J.; McFarlane, B. P.; Martin, G. D.; Meyer, Susette; Miles, V.; Miller, Erin; Miller, Helen; Miller, Merle; Neblett, B. M.; Omohundro, P. S.; Pearce, Ella; Rabe, R. F.; Rach, Edgar; Robison, W. C.; Russell, J. H.; Simonds, A. W.; Sprain, Minnie; Taylor, W. C.; Timm, Julia; Toles, Mabel; Trimble, Belle; Turner, P. A.; Ward, Margaret; Whaling, Ruth; Williams, L. W.; Winston, C. J.; Wulff, R. G.; Wupperman, R. O.

1 d. Analytical Geometry (83 Women, 111 Men). *A (Excellent)* Abernathy, Maidette; Bailey, J. W.; Bell, Major; Burrell, Julia; Cartledge, Elizabeth; Chandler, Elizabeth; Eidson, J. A.; Garner, J. T.; Henderson, Mary; Howard, Will; Hudson, Louise; Kallus, E. J.; Lamar, Lois; Middlebrook, Hattie; Niebuhr, Angela; Perkins, Olivia; Preddy, J. R.; Ross, J. W.; Weiner, Jennie; Williams, Fleta; Wright, Thelma. *B (Good)* Armstrong, Mary; Becker, Hugo; Burke, Audrey; Collins, B. R.; Douglas, Mrs. V. C.; Duckworth, I. L.; Freeman, Ross; Granberry, Richard; Guinn, Mabel; Harris, Mary E.; Hampton, J. A.; Hightower, Frank; Jones, Margaret; Junkin, Fred; Kerns, Evelyn; Lawrence, B. A.; Leake, Lewis; Lochte, E.; Lowrey, L. G.; Meyer, Susette; Miles, V. G.; Miller, Helen; Miller, J.; Monger, Neal; Morton, Egra; Newton, Guy; Poindexter, Cary; Rabke, R. F.; Rach, Edgar; Ross, Lillian; Reuss, G. T.; Simonds, A. W.; Timm, Julia; Toles, Mabel; Wilkinson, Annie; Wilson, J. M.

1 eg. Solid Geometry (168 Women, 193 Men). *A (Excellent)* Boner, C. P.; Boog, J. C.; Donathan, Willy; Edman, Grace; Enloe, Olive; Fred, Gus; Hume, Georgia; Kepler, Dorothy; Miller, J. D.; Potter, Autrey; Wolflin, Lee; Woodward, Mabel. *B (Good)* Ardis, Gladys; Bowden, Daisy; Bussey, Frances; Cabiness, Ena; Carter, Frances; Chapa, Concha; Chenault, L. R.; Christenson, Clara; Day, Garland; English, Dudley; Gillen, Ralph; Greenwade, F.; Hightower, Vernon; Hill, W. H.; Howle, Ruth; Johnson, J. E.; Kline, Max; Lubben, Renke; Martin, Johanna; Nelson, Elizabeth; Peek, Sterling; Rice, Margaret; Rubio, J.; Sandstrom, O. W.; Strack, Emma; Trau, Frank; Tuttle, Carolyn; Ullrich, Lydia; Waghalter, Abner; Waltmore, D. W.; Wolens, Louis.

3. Calculus (12 Women, 30 Men). *A (Excellent)* Wilson, L. A. *B (Good)* Burch, Ethel; Hazel, G. G.; Newell, Mary; Normand, C. E.; Seymour, Cora.

9. Investment and Life Insurance (2 Women, 15 Men). *A (Ex-*

cellent) Langston, Walter; Mothershead, B. S. *B (Good)* Graham, Fletcher; Stocking, Ruth.

10. Introduction to Modern Analytic Geometry (6 Women, 4 Men). *A (Excellent)* Brand, C. E. *B (Good)* Benson, Amelia; Hammer, Henry; Nelson, Grace; Woodul, Lottie.

11. Advanced Calculus (5 Women, 5 Men). *A (Excellent)* Ward, Josephine. *B (Good)* Benson, Amelia; Cardenas, Salvador; Foster, Arthur; Hammer, H. H.; Nelson, Emma; Notley, L.; Rush, R. R.; Von Koenneritz, Helena; Woodul, Lottie.

13. Advanced Mathematics (2 Women, 2 Men). *A (Excellent)* Benson, Amelia; Brand, Clarence; Decherd, Mary; Notley, L.

17. Fouriers Series (3 Men). *B (Good)* McCarty, L. E.

20. Probability (1 Woman, 5 Men). *A (Excellent)* Decherd, Mary; Higdon, J. C.; McCarty, L. E. *B (Good)* Langston, W. G.; McCarter, T. B.

115 s. Solid Analytic Geometry (11 Women, 10 Men). *A (Excellent)* Clapp, Sarah; Cottingham, Ruth; Von Koenneritz, Helena; Bailey, Claude; Kern, Jas.; McCarty, L.; Wilson, Lemuel. *B (Good)* Berry, Jessie; Purdy, Daisy; Bralley, Ernest; Hazel, Gideon.

215. Plane Analytic Geometry (18 Women, 28 Men). *A (Excellent)* Ward, Josephine; Trask, Parker. *B (Good)* Lovelace, Marie; Purdy, Daisy; Bailey, Claude; Hazel, Gideon; Kerr, J. L.; Wilson, Lemuel.

Music

1. Harmony and Melody (17 Women, 2 Men). *A (Excellent)* Basford, O. L.; Maxwell, Mrs. J. H. *B (Good)* Board, Maude; Boone, Geraldine; Comer, Mayme; Jackson, Katie; Johns, Flora; LeSuer, Lula; Morrall, Kathleen; Tobin, Ida.

2. Advanced Harmony (9 Women). *A (Excellent)* Dunlay, Amanda; Garrison, Anne; Sauter, Mary.

5. History and Appreciation of Music (14 Women, 5 Men). *B (Good)* Biggers, Vernon; Lewis, Selma; Watkins, Myrtis.

104. University Chorus (40 Women, 11 Men). *A (Excellent)* Abraham, Lucille; Barnett, Ellis; Berry, Jessie; Douglas, Mavis; Farrow, Cary; Hume, Winifred; Kosanke, Emma; Landrum, Miriam; Levy, Zerlina; McGregor, Elizabeth; Meyer, Louise; Owen, Neva; Robertson, Bessie; Traeger, Gazelle; Wacker, A. J.; Watts, Eloise; Whitsitt, Grace; Wiggs, Ada; Williams, Fleta. *B (Good)* Baker, Reba; Bogle, Ura; Bruce, Alice; Fisher, Susie; Jackson, Katie; Martin, Lillian; Meade, Gertrude; Sadler, Lois; Saunick, Mrs. S.; Fry, Mildred.

106. Ensemble Playing (16 Women). *A (Excellent)* Corbin, Vida; Garrison, Anne; Landrum, Miriam; LeSuer, Lula; Sauter, Mary. *B (Good)* Board, Maude; Hatch, Josie; Johns, Flora; Kerns, Eveyln; Kerns, Marion; Watkins, Myrtis.

PHILOSOPHY

9. HISTORY OF PHILOSOPHY (7 Women, 6 Men). *A (Excellent)* Brand, C. E.; Sowell, Lois; Ullrich, O. A.; Young, Jeffie. *B (Good)* Kuehne, Helen; Robinson, Annie.

20. SEMINARY (1 Woman). *B (Good)* Rogers, L. R.

23. LOGIC AND EPISTEMOLOGY (2 Women). *B (Good)* Denny, Grace.

27. RESEARCH (1 Man). *A (Excellent)* Brand, C. E.

28. ETHICS (6 Women, 1 Man). *B (Good)* Cleveland, Nellie; Muse, Mary Grace; Voorhies, H. L.

102 w. LOGIC (49 Women, 51 Men). *A (Excellent)* Bailey, E. A.; Barrow, Anna; Barlow, Vivian; Dunlay, Amanda; Green, P. H.; Gardner, Anna; Harrell, Ruth; Hartman, Gus; Hughes, Elizabeth; Hume, Winifred; Harris, Pauline; Johnson, Ruth; Rowe, Frances; Shelton, Mary; Thomas, J. L.; Trenckman, Else; Ward, W. D. *B (Good)* Bean, Fern; Bailey, J. W.; Brahan, R. W.; Beverly, J. R.; Batten, R. K.; Bumpas, Elsie; Coor, Minnie; Duke, L. B.; Dameron, T.; Edward, Hazel; Fitzwilliams, Grace; Gray, Mattie; Harwell, Sam; John, Marguerite; Janoch, Helen; Keeling, Janie; Kangerga, A.; Lightfoot, Etta; Lochte, H. L.; McChesney, M. E.; Mays, A. P.; McClendon, H. P.; Olenbush, H.; Rhea, L. H.; Stephens, Thelma; Tedford, R. E.; Wier, Lottie; **Thompson, E. O.**

102 s. LOGIC (7 Men). *A (Excellent)* Dale, Warren. *B (Good)* Davis, **S. W.; Maxwell, A. I.**

103 s. ETHICS (43 Women, 30 Men). *A (Excellent)* Barlow, Vivian; Dunlay, Amanda; Harris, Pauline; Hume, Winifred; Hughes, Elizabeth; Keasby, Louisa. *B (Good)* Akin, J. W.; Berry, Ellavise; Batten, R.; Blakeney, Cora; Byrd, Alice; Beverly, James; Bumpass, Elise; Cox, Mary; Dameron, T.; Davis, J.; Edwards, Hazel; Gatewood, W. S.; Huston, C.; Jordt, Elsie; Kennedy, M.; Lightfoot, Henryetta; Levy, **Zerlina**; Murray, Wiley; McCurdy, Elizabeth; Rountree, Gladys; Shelton, Mary; Tedford, R.; Woodley, Opal; Wier, Lottie; Whaling, Ruth.

104 f. INTRODUCTION TO PHILOSOPHY (36 Women, 35 Men). *A (Excellent)* Feuille, Estelle; Graham, Nora; Harris, Pauline; Hartman, G. A.; Keasbey, Louisa; Musechke, Paul; Spaeth, Louise; Sweet, Martha; Winslow, Elizabeth. *B (Good)* Adams, F. W.; Boothe, Viva; Doggett, W. T.; Dumars, J. L.; Goolsby, J. L.; Harling, L. C.; Hawkins, Eudora; Haynes, F. E.; Hazel, G. G.; Hodges, T. A.; Howard, George; Hudson, Sophia; Johnson, Gillis; McChesney, Mary; McClendon, H. P.; McLaughlin, Mildred; Morris, Mrs.; Newman, Grace; Potts, Ruth; Rose, Gladys; Stayton, Annie; Thompson, Minette; Watson, Winifred; Wooten, Lynn.

119 w. BRITISH PHILOSOPHY (2 Women). *A (Excellent)* Raymond, Mrs.

205 ws. PHILOSOPHY IN RELATION TO LITERATURE (13 Women, 13 Men). *A (Excellent)* Keasbey, Louisa; Rose, Gladys; Spaeth, Louise. *B (Good)* Bell, Jennie; Doggett, W. T.; Frank, Pauline; Gleckler, V.;

Hammer, H. H.; Harris, Pauline; Johnson, J. E.; McLaughlin, M.; Ward, Elizabeth.

Psychology

27. Research (1 Woman, 1 Man). *A (Excellent)* Ullrich, O. A.; Barber, Alda.

51. Advanced Psychology (2 Women, 2 Men). *A (Excellent)* Ullrich, O. A. *B (Good)* Brand, C. E.; Sowell, Lois.

101f. Introductory Psychology (75 Women, 92 Men). *A (Excellent)* Alvey, Glenn; Blattner, Mary; Bonner, Lena; Crager, J. C.; Cunningham, O. R.; Foster, Lois; Higdon, J. C.; Knight, Otis; Masters, Mildred; Meyer, May; Mothershead, B. A.; Niebuhr, Angela; Odgers, Olivia; Voelkel, Elsie. *B (Good)* Barlow, Vivian; Basford, O. L.; Bell, Leonora; Bonnett, Edith; Bumpass, Elsie; Cox, Mary; Davis, James; Ditto, F. C.; Dunlay, Amanda; Field, B.; Faust, C. G.; Frank, Pauline; Gatewood, W. S.; Goforth, J. L.; Hibbard, Fred; Hillyer, L. R.; Hume, Winifred; Hunt, Virginia; Jackson, Lillian; Johns, Flora; Keasby, Louisa; Kline, Max; Knight, M. A.; Lee, Blanche; Little, Harry; McCammon, Matilda; McKenna, Kittie; Moore, H. R.; Pope, F. S.; Potash, Bertha; Robb, T. H.; Rogers, Mabel; Scott, F. B.; Stocking, Ruth; Thomas, S. J.; Wier, Lottie; Williams, Rosamund; Zihlman, Agnes.

108 w. Abnormal Psychology (8 Women, 2 Men). *A (Excellent)* Pearce, Mrs.; Sowell, Lois. *B (Good)* Cleveland, Nellie; Corley, W.; Kniker, Hedwig; Muse, Mary; Norman, Emma; Olson, G. C.; Pryor, Margaret.

114 s. Social and Applied Psychology (9 Women, 3 Men). *A (Excellent)* Muse, Mary; Pearce, Mrs.; Sowell, Lois. *B (Good)* Cleveland, Nellie; Kniker, Hedwig; Kuehne, H. R.; Massey, Mrs.; Norman, Emma; Olson, G. C.; Pryor, Margaret.

118 f. Innstinct (8 Women, 2 Men). *A (Excellent)* Norman, Emma; Olson, G. C.; Pearce, Mrs.; Sowell, Lois. *B (Good)* Kniker, Hedwig; Muse, Mary; Pryor, Margaret.

141 w. Sensation (12 Women, 15 Men). *A (Excellent)* Joseph, D. L.; Potash, Bertha; Stocking, Ruth; Wynne, Vivien. *B (Good)* Basford, L.; Burns, A.; Catterall, Mary; Cheesborough, Floride; Cole, W. R.; Goforth, J. L.; Von Koenneritz, Helena; Sloan, Winnie; Trabue, W.

142 s. Sensation (10 Women, 13 Men). *A (Excellent)* Bonnett, Edith; Catterall, Mary; Potash, Bertha; Wynn, Vivian. *B (Good)* Basford, O. L.; Cheesborough, Floride; Cole, W. R.; Deen, Arthur; Goforth, J. L.; Hatch, Josie; Joseph, D. L.; McKay, G. D.; Trabue, W.

Physics

1. General Physics (44 Women, 409 Men). *A (Excellent)* Erwin, J. C.; Fred, B. B.; Hamill, D. B.; Humphries, J. T.; Kallus, E. J.;

McKay, J. A.; Peace, Dewy; Ross, J. W.; Seymour, E. C.; Williams, Ralph; Winslow, Elizabeth. *B (Good)* Basse, G. A.; Batten, R. K.; Bergson, Elsie; Boner, C. P.; Boog, J. C.; Brady, J. J.; Bullen, C. V.; Castle, W. R.; Chiles, P. S.; Clements, V.; Copeland, Mary; Day, Garland; Dunn, N. L.; Elledge, V. L.; Enloe, D. C.; Enloe, Olive; Fuller, G. C.; Gowan, C.; Hampton, J. A. M.; Harding, B. M.; Hargrove, W. C.; Heavenhill, Eunice; Heavenhill, H. G.; Henderson, Adele; Henderson, Mary; Hickerson, J. D.; Hill, W. H.; Hofer, Leslie; Inserillo, C. R.; Joekel, C. L.; Jonas, Richard; Keith, Mabel; Kennedy, E. C.; Lancaster; H. E.; Link, R. L.; McChesney, Mary; McDonald, J. C.; McFarlane, B. P.; McLean, Katherine; McNess, R. A.; Meyer, Susette; Morris, Blanche; Nelson, Emma; Newby, Arthur; Owens, Neva; Pevehouse, Henry; Phillips, Jack; Poindexter, Carey; Rabke, R. F.; Roberts, Frank; Rogers, Mabel; Spikes, J. N.; Timmins; Trau, Frank; Ulrich, Lydia; Williams, Lester; Wilson, J. M.; Wright, Thelma.

4. Electricity and Magnetism (3 Women, 4 Men). *B (Good)* Von Koenneritz, Helena; Ward, Josephine.

33. Light and Photography (1 Woman, 4 Men). *A (Excellent)* Woodul, Lottie.

35. Elementary Mechanics (4 Men). *A (Excellent)* Nichols, Marvin. *B (Good)* McCarty, L. P.

43. Spectroscopy (1 Woman, 2 Men). *A (Excellent)* Benson, Amelia; McPherson, A. T.

109 f. Kimetic Theory of Gases (1 Woman, 3 Men). *A (Excellent)* Kariel, L. W. *B (Good)* Barnes, J. A.; Benson, Amelia; Buehrer, F. F.

116s. Precision of Measurements (3 Men). *A (Excellent)* Nichols, Marvin. *B (Good)* McCarty, L. P.

117f. Vibratory Motion (11 Men). *A (Excellent)* Dale, R. H.; Delhomme, L. K.; Higdon, J. C.; Matejka, J. C. *B (Good)* Craig, W. M.; Glazebrook, C. S.; Rush, R. R.; Thomas, J. L.

128 f. High Temperature Measurements (5 Men). *A (Excellent)* McCarter, T. B.; Moore, N. H.; Phipps, T. E. *B (Good)* Craig, W. M.; Rush, R. R.

129. Seminary (6 Men). *B (Good)* Higdon, J. C.; McCarty, Lawrence; Rush, R. R.; Thomas, J. L.; Wachendorfer, Chas.

134. Terrestrial Magnetism (3 Men). *B (Good)* McCarty, L. E.; Rush, R. R.

137s. Experimental Electric Waves (2 Men). *A (Excellent)* Rush, R. R.; Thomas, J. L.

211. Conduction of Electricity Through Gases (1 Woman, 3 Men). *A (Excellent)* Benson, Amelia; Kariel, L. W. *B (Good)* Barnes, J. A.; Buehrer, T.

218 ws. Varying Currents (1 Man). *A (Excellest)* Higdon, J. C.

227 ws. Electric Waves (8 Men). *A (Excellent)* Delhomme, L. K.; Higdon, J. C. *B (Good)* Craig, W. M.; Dale, R. H.; Matejka, J. V.; Rush, R. R.; Thomas, J. L.

231. Electrical Measurements (1 Woman, 20 Men). *A (Excellent)*

Naeter, A.; Von Koenneritz, Helena; Zuhlke, Emil. *B (Good)* Fernandez, L. A.; Franke, L. A.; Gadberry, J. L.; Seebe, A.; Young, D. C.

422. Mechanics, Electricity and Heat (2 Women, 61 Men). *A (Excellent)* Baker, L.; Berkley, W. E.; Clark, Roxie. *B (Good)* Archer, O. B.; Bralley, E. M.; Lawrence, M. T.

Public Speaking

15. Seminary (13 Men). *A (Excellent)* Crossman, J. W.; Field, R. M. *B (Good)* Hartman, G. A.; Parten, J. R.; Senor, F. R.; Williams, P.

104 f. Advanced Debate (13 Men). *B (Good)* Dale, W.; Taylor, H. L.

105. Reading and Speaking (168 Men). *A (Excellent)* Hexter, L. J.; Poindexter, Cary; Womack, R. H. *B (Good)* Biggers, C.; Black, H. W. M.; Blocker, Harry; Carpenter, O. P.; Cofer, J. D.; Dameron, T.; Day, Garland; Elliot, L.; Elledge, V.; Garner, J. T.; Gillen, R. R.; Granger, A. T.; Haigh, Albert; Harlan, Will; Hickerson, J.; Jackson, J. E.; Jonas, P.; Jungjohamm, Chris; King, C. H.; King, Everet; McMahon, Paul; Martin, Geo.; Miller, Jas.; Mossiker, Jacob; Naugle, W. C.; Pollard, T. G.; Russell, J. R.; Sandstrom, P. W.; Seymour, E. E.; Strasburger, H.; Trau, Frank; Veltman, C.; Waghalter, Abner; White, Fred.

109 f. Extempore Speaking (52 Men). *A (Excellent)* Banks, W. S.; Beazley, Guy; Blalock, Jack; Brookshier, J. P.; Condron, E. D.; Greene, P. H.; Hammer, H. H.; Jones, T. E.; Sames, Harry; Simmonds, D. *B (Good)* Buchanan, Dan; Evans, D. T.; Hargrove, H. H.; Hearne, W.; Huffman, P. R.; Houston, C. H.; Jones, E. T.; Kerr, J. L.; Lowry, D.; McClendon, S. S.; Sadler, W. H.; Thompson, J.

114f. Oral Reading (23 Women). *A (Excellent)* Corbin, V. C.; Lee, Blanche; Meyer, Margaret; Rennie, M. *B (Good)* Andrews, Elizabeth; Bartz, Rosalie; Bassel, Annie; Bigham, Eura; Brigham, Veraffi Candler, Martha; Hogue, Sammy; Kirkpatrick, Mary; Klett, Mamie; Kosanke, Emma; MacGregor, Elizabeth; Miller, Gladys; Morris, Ethel; Parson, E. B.; Pickett, R.; Robinson, Annie; Russell, Pearl; Sewell, M. R.; Traeger, G.

115w. Oral Composition (29 Women). *A (Excellent)* Andrews, Elizabeth; Brigham, Vera; Corbin, V. C.; Hawkins, E.; Lee, Blanche; Rennie, Margaret; Robinson, Annie; Marshall, M. *B (Good)* Bartz, R.; Bigham, E.; Candler, M.; Fisher, S.; Hunt, V.; Klett, M.; Kosanke, E.; MacGregor, E.; Morris, Mrs.; Parson, E. B.; Pence, Mrs. E.; Russell, Pearl; Traeger, G.; Payne, N.

116s. Argumentation (30 Women). *A (Excellent)* Brigham, V. E.; Cheesborough, F.; Corbin, V. C.; Hawkins, E. A.; Lee, Blanche; Meyer, M.; Pence, Mrs.; Robinson, A. B.; Russell, Pearl. *B (Good)* Bartz, R.; Braswell, C.; Klett, M.; Morris, E. M.; Parson, Edith; Sullenberger, L.

208ws. Oratory (27 Men). *A (Excellent)* Cook, J. A.; Racey, Erie.

B (Good) Elliott, L.; Harding, B. M.; Harlan, W. A.; Machemehl, H. H.; Tedford, R. E.

210ws. Debite (75 Women). *A (Excellent)* Cofer, J. D.; Condron, E. D.; Ferguson, J. B.; McQueen, Frances. *B (Good)* Banks, W. S.; Bender, E. C.; Caton, R. L.; Gross, L. H.; Heare, W. C.; Huffman, R. R.; Hull, T. P.; Jackson, D. W.; McClendon, S. G.; Moore, F. W.; Norwood, W. C.; Uhl, A.; Terry, C. L.

Russian

2. Intermediate Russian (4 Women, 1 Man). *A (Excellent)* Wilson, Margaret. *B (Good)* Jurcak, Vlaska; Hegar, J.

Spanish

A. Beginners' Spanish (182 Women, 242 Men). *A (Excellent)* Baen, Mary; Childress, Ladye; Donathan, W. H.; Gracey, Mary; Green, T. M.; Hair, Nan; Hughes, Elizabeth; Knight, Otis; Lancaster, Linda; Northrup, P.; Preston, Anna; Rumsey, Delia; Way, Jean; Wynn, Nannie; Wynne, Vivian. *B (Good)* Ables, Mable; Akin, F. W.; Andrews, Elizabeth; Austin, Edith; Barrow, L. T.; Breustedt, Lillian; Catterall, Mary; Clabough, Morien; Coor, Minnie; Cox, Davie; DuPuy, Margaret; Eberle, Hulda; Edman, Grace; Ellis, Nancy; Fischer, Louise; Graham, Fletcher; Greer, Sam; Hazel, G.; Heflin, Alta; Henry, L. C.; Howle, Ruth; Johns, Theresa; Jones, A. J.; Jones, Nell; Karbach, Olivia; Link, R. L.; Miles, V. G.; Miller, Erin; Mothershead, B. S.; Newell, Mary; Pauls, W. R.; Rogers, Elinor; Snaveley, Doris; Stallings, Hope; Tillery, C. B.; Waghalter, Abner; Waltmore, D. W.; Ward, M.; White, F. J.; Wilson, Jesse; Wohlberg, M.; Yeats, Eva.

1. Grammar, Reading, and Composition (115 Women, 108 Men). *A (Excellent)* Cotham, M.; Greene, P. H.; Watson, Mary. *B (Good)* Allen, Mary Louise; Alvey, Glenn; Bergston, Elsie; Beverly, J. R.; Boynton, Alex; Collett, Jeanett; Fitzwilliam, Grace; Hoit, Dorothea; King, C. H.; Lowrey, V. L.; Miller, F.; Rountree, Mary; Strackbein, O. R.; Stroud, Georgia; Stullken, Florence; Thompson, Mary; Toles, Mabel.

2. Contemporary Literature (47 Women, 31 Men). *A (Excellent)* Byrd, Alice; Goolsby, J. L.; Graham, Nora; Hamer, Annie; Molesworth, Kathleen; Rubio, J. S. *B (Good)* Ball, Grace; Barrow, Anna; Elliott, Katherine; Janoch, Helena; Joiner, Maud; Kosanke, Martha; Mobley, Helen; Morris, Mrs. Ethel; Nelson, Elizabeth; Robb, T. H.; Schultz, Mrs. Irene; Zilhman, Agnes.

8. Classical Prose (11 Women, 2 Men). *A (Excellent)* Bell, Ruby; Raymond, Mrs. D. *B (Good)* Chapa, C.; Feuille, Estelle; Kress, Mrs.; Sims, E. R.; Sloan, Winnie; Woodbridge, Elizabeth.

16. History of Spanish Literature (9 Women, 2 Men). *A (Excel-*

lent) Belger, Harriett; Sloan, Winnie. *B (Good)* Haynes, Randolph; Ogier, Agnes; Williams, Rosamond.

17. Old Spanish (2 Women). *A (Excellent)* Kennedy, Ruth.

20. Conference Course (2 Women). No honors.

22. Conversation and Composition (35 Women, 33 Men). *A (Excellent)* Graham, Nora; Molesworth, Kathleen. *B (Good)* Bailey, J. W.; Becker, Hugo; Bell, Florence; Chandler, Elizabeth; Janoch, Helena; Thomas, J. L.; Young, Jeffie.

Zoology

1. General Zoology (45 Women, 143 Men). *A (Excellent)* Edwards, Hazel; Fred, Gus; Karbach, Olivia; McKay, J. A. *B (Good)* Barnett, W. C.; Brady, Jesse; Deen, Arthur; Dewey, Mary; Donaldson, Elizabeth; Erwin, J. C.; Glover, O. E.; Gray, Mamie; Granberry, Richard; Hamill, D. B.; Hampton, J. A.; Henderson, Elisha; Hight, J. D.; Humphries, J. T.; Joekel, C. L.; Kelly, S. F.; Little, Harry; McLean, Katherine; Norman, J. I.; Peace, D. W.; Poindexter, Cary; Rimassa, J. M.; Ross, A. A.; Thrasher, Mary; Tucker, S. B.; Turner, P. A.; Wilkinson, Anne; Wilson, Glenn.

3. Invertebrate Zoology (1 Woman, 3 Men). *A (Excellent)* Hofer, Leslie.

4. Vertebrate Zoology (8 Women, 34 Men). *A (Excellent)* Tucker, Victor. *B (Good)* Brandenberg, S. E.; Deberry, E. M.; Haynes, Helen; Hillyer, LeRoy; Jordan, E. M.; Kline, M. O.; Ledbetter, P. V.; Marshall, Mrs.; Miller, N. C.; Sams, L. C.; Woodward, T. L.

7. Advanced Zoology (3 Men. *B (Good)* Holman, E.; Stiefel, Dan.

16. General Physiology and Hygiene (93 Women, 34 Men. *A (Excellent)* Doran, Agnes; Edman, Grace; Faust, C. G. *B (Good)* Agnew, Floy; Beall, May; Cheesborough, Floride; Cotham, M.; Green, Frances; Harrell, Ruth; Heimsath, Chas.; Hume, Winifred; Knight, Richard; Knippa, Hilda; Rach, Edgar; Ray, W. L.; Roth, Magdalene; Rountree, Mary; Ward, Margaret; Weatherbee, Sara; Wherry, Pauline; Williams, Marguerite; Works, Belle.

29. Cytology (2 Women). *A (Excellent)* Weber, Roxie. *B (Good)* Janoch, Lillian.

104 f. (9 Women, 3 Men). *A (Excellent)* Brownrigg, T. H. *B (Good)* Allensworth, Margaret; Belger, Harriet; Morford, Elizabeth; Newman, Grace.

105 w. Organic Evolution (22 Women, 30 Men). *A (Excellent)* Booth, Viva; Brownrigg, T. H.; Dunn, N. L.; Foster, Lois; Kline, M. O.; Knight, M. A.; McKay, J. A.; Morford, Elizabeth; Niebuhr, Angela; Sewell, Mary. *B (Good)* Allensworth, Margaret; Daniel, Camille; DeBerry, E. M.; Hogue, Sammy; Keese, Walter H.; Miller, Norman; Muckleroy, Anna.

106 s. Heredity (18 Women, 27 Men). *A (Excellent)* Boothe, Viva; Daniel, Camille; Gorman, J. J. *B (Good)* Allensworth, Margaret;

Belger, Harriet; Brownrigg, T. H.; Haynes, Helen; Hillyer, LeRoy; Kilgore, H.; Kline, M. O.; Knight, M. S.; Morford, Elizabeth.

108. Zoological Seminary (2 Women, 5 Men). *A (Excellent)* Crager, J. C.; Goforth, J. L.; Stiefel, Dan.

125 w. Evolution (4 Women, 10 Men). *A (Excellent)* Bowles, C. E.; Buice, W. A.; Crager, J. C.; Goforth, J. L.; Gore, Arthur; Stiefel, Dan; Winkler, A. J. *B (Good)* Bryson, Margaret; Denny, Grace; Holman, Eugene.

126 s. Genetics (3 Women, 10 Men). *A (Excellent)* Bowles, C. E.; Crager, J. C.; Denny, Grace; Goforth, J. L.; Hofer, Leslie; Stiefel, Dan. *B (Good)* Gore, A. L.; Holman, Eugene; Winkler, A. F.

128. Zoological Seminary (2 Women, 2 Men). *A (Excellent)* Weber, Roxie. *B (Good)* Goff, Gomer; Janoch, Lillian; Snyder, F. L. B.

410. Cellular Biology and Embryology (3 Women, 13 Men). *A (Excellent)* Goforth, J. L. *B (Good)* Crager, J. C.; Hinds, J. H.; Holman, Eugene; Marshall, Mrs.

412. Problems, Invertebrate Zoology (3 Women). *A (Excellent)* Vanneman, Aimee; Weber, Roxie. *B (Good)* Janoch, Lillian.

HONOR LIST, 1916-1917

DEPARTMENT OF ENGINEERING

Architecture

20. Instrumental Drawing (3 Women, 12 Men). *A (Excellent)* Bullen, C. V.; Bullen, L. D. *B (Good)* Alsup, Raymond; Eickenroht, M.; Holden, Mary; Howell, M. A.

22. Architectural Design (3 Women, 11 Men). *B (Good)* Beckmann, K. D.; Davis, E. E.; Jenkins, R. L.; Leary, Verna; Lipscomb, R.; Trout ,G. M.

23. Architectural Design (5 Women, 6 Men). *B (Good)* Fairweather, E. E.; Gentry, A. C.; Jones, M. L.; Secor, J. W.; Vanderstraten, R.

24. Architectural Design (6 Men). No honors.

28. Building Construction (2 Women, 3 Men). *B (Good)* Atkinson, J. B.; Giesecke, Alma; Jacobs, Alma; Netzer, F. S.

30. Building Construction (1 Woman, 2 Men). *B (Good)* Atkinson, J. B.; Jacobs, Alma.

35. Architectural Design (2 Men). No honors.

101. Freehand Drawing (8 Women, 14 Men). *B (Good)* Bullen, L. D.; Bullen, C. V.; Eichenroht, M.; Hoit, Dorothea; Hofer, Leslie; Williams, J. A.

102. Freehand Drawing (8 Women, 12 Men). *A (Excellent)* Beckman, K. D.; Fairweather, E. E. *B (Good)* Bogle, Ura; Davis, E. E.; Lipscomb, R. A.; Niven, H. B.; Smith, R.; Shepard, Julia; Trout, G. M.

103. Freehand Drawing (3 Women, 7 Men). *B (Good)* Gentry, A. C.; Jones, M. L.; Vanderstratten, R.

104. Freehand Drawing (5 Women, 7 Men). *B (Good)* Atkinson, J. B.; Grigsby, E. W.

112. Architectural History (2 Women, 9 Men). *A (Excellent)* Beckman, K. D. *B (Good)* Davis, E. E.; Shepard, Julia; Trout, G. M.

121f. Working Drawings (4 Women, 10 Men). *A (Excellent)* Beckman, K. D.; Davis, E.; Leary, Verne; Niven, K. B.; Trout, G. M. *B (Good)* Glover, Maleta; Oldham, W. B.; Sellors, Fannie.

125. Architectural Rendering (3 Women, 11 Men). *B (Good)* Grigsby, E. W.; Vanderstratten, R.

126. Architectural History (2 Women, 9 Men). *A (Excellent)* Hoit, Dorothea; Fairweather, E. *B (Good)* Blocker, T. B.; Gentry, A. C.; Jones, M. L.; Vanderstratten, R.

131. Building Sanitation (2 Women, 4 Men). *B (Good)* Atkinson, J. B.; Giesecke, Alma; Jacobs, Alma.

137. Freehand Drawing (4 Women, 2 Men). *B (Good)* Sellors, Fannie.

138. Freehand Drawing (2 Women, 2 Men). *B (Good)* Giesecke, Alma; Sellors, Fannie.

139. History of Sculpture (3 Women, 7 Men). *B (Good)* Biggers, V. W.; Hornsby, H.; Hoit, Dorothea.

206. Shades, Shadows, and Perspective (7 Women, 15 Men). *A (Excellent)* Howell, M. A. *B (Good)* Bullen, L. D.; Bullen, C. V.; Eichenroht, M.

227. Building Construction (1 Woman, 8 Men). *A (Excellent)* Fairweather, E. E. *B (Good)* Gentry, A. C.; Hornsby, Hazel; Jones, M. L.

229. Building Sanitation (2 Women, 6 Men). *B (Good)* Giesecke, Alma; Jacobs, Alma.

236. Architectural Design (2 Men). No honors.

150. Research In Architecture (1 Man). No honors.

Civil Engineering

30. Railroad Engineering (28 Men). *A (Excellent)* Merrill, G. P. *B (Good)* Dale, R. H.; Goodfellow, J. J.; Laird, S. T.; Simpson, H. A.; Towne, H. R.

31. Structures (15 Men). *A (Excellent)* Hodges, T. A. *B (Good)* Eaheart, J.; Petty, Olive.

32. Applied Mechanics (1 Woman, 52 Men). *A (Excellent)* Hodges, T. A.; Nichols, M. C. *B (Good)* Franke, L. A.; Granger, A. T.; Seebe, A.; Thomas, M. W.; Wear, J. P.; Zuhlke, E.

101f. Highway Engineering (31 Men). *A (Excellent)* Anderson, A. J.; Heath, W. F.; Hedick, B.; Laird, S. T.; Park, D. E.; Tyler, D. O. *B (Good)* Bromley, T. B.; Collins, W. H.; Early, J. B.; Glazbrook, C. S.; Harpold, C. J.; O'Connell, D.; Rayzor, J. P.; Simpson, H.; Taylor, W. H. D.; Tinoco, Luis.

101 w. Highway Engineering (6 Men). *B (Good)* Roy, N. H.

101s. Highway Engineering (6 Men). *A (Excellent)* Granger, A. T.; Hodges, T. A.; Nichols, M. C. *B (Good)* Jordan, I. W.

102. Plane Surveying (18 Men). *A (Excellent)* Clements, V.; Fuller, G.; Kennedy, E. C.; Williams, S. A. *B (Good)* Baker, Lorena; Bissett, E.; Davis, J. H.; Roberts, F. G.; Trau, F. G.; Wickline, E.

103f. Descriptive Geometry (13 Men). *A (Excellent)* Baker, L.; Lawrence, M.

103 w. Descriptive Geometry (27 Men). *A (Excellent)* Harrison, W. H. *B (Good)* Gerling, F. P.; Laird, S. T.; Logan, W. B.; O'Connell, Dan.

103 s. Descriptive Geometry (9 Men). *A (Excellent)* Wear, J. P. *B (Good)* Zant, J. B.

107. Geodesy (9 Men). *A (Excellent)* Eaheart, Wm. *B (Good)* Browne, Nolan; Petty, O. S.

113 w. Masonry Construction (14 Men). *A (Excellent)* Park, D. E. *B (Good)* Eaheart, J.; Hodges, T. A.; Nichols, M. C.; Petty, O. S.

115 f. Sanitary Engineering (9 Men). *A (Excellent)* Browne, Nolan. *B (Good)* Eaheart, J.; Greer, J. F.; Petty, O. S.

116 w. Water Supply (12 Men). *A (Excellent)* Eaheart, Jno.; Fredericks, V.; Park, D. E.; Petty, O. S. *B (Good)* Browne, Nolan; Glazbrook, C. S.; Heath, W. F.; Thomas, M. W.; Ward, J.

117f. Structures (5 Men). *B (Good)* Browne, Nolan; Glazbrook, C. S.

118w. Stresses In Complex Structure (4 Men). *A (Excellent)* Glazbrook, C. S. *B (Good)* Browne, N.

119. Field Work (1 Woman, 20 Men). *B (Good)* Hobbs, O. K.; Trau, F. G.; Wickline, E.

126 s. Mechanics (75 Men). *A (Excellent)* Laird, S. T.; Towne, H. R. *B (Good)* Archer, O. B.; Berkley, W. E.; Collins, W. H.; Davis, E.; Lawrence, M. T.; Maxwell, A. C.; O'Banion, A. L.; O'Connell, D.; Seaholm, W. E.; Tinoco, Luis.

128. Laboratory Work (44 Men). *A (Excellent)* Seebe, A. *B (Good)* Brooks, C. H.; Fairweather, E. E.; Franke, L. A.; Hodges, T. A.; Zuhlke, E.

129. Field Work (3 Men). No honors.

133s. Reinforced Concrete (9 Men). *A (Excellent)* Barrow, J. O.; Brown, Nolan; Betty, O. S. *B (Good)* Friedericks, V.; Heath, W. F.; Hodges, M. B.; Ward, J. E.

136w. Surveying for Electrical Engineers (12 Men). *B (Good)* Davis, E. E.; Leary, V.; Franke, A. L.; Lawrence, M. T.

137s. Theory of Economic Railway Location (15 Men). *A (Excellent)* Granger, A. T.; Hodges, T. A.; Petty, O. S. *B (Good)* Barrow, Joseph; Browne, Nolan; Eaheart, J.; Freidericks, V.; Nichols, M. C.

138. Arches (3 Men). No honors.

139. Sophomore Field Work (28 Men). *B (Good)* Gerling, F. P.; Laird, S. T.; Rose, E. A.

140. Junior Field Work (1 Man). No honors.

148. Highway Lab (15 Men). *A (Excellent)* Rightor, F. E.; Sens, Lee. *B (Good)* Gerling, F. P.; Goodfellow, J. J.; Friedrichs, V.; Laird, S. T.; O'Connell, Dan; Simpson, H. A.

149. Advanced Highway (9 Men). *B (Good)* Barrow, J. O.; Eaheart, J. W.; Friedrichs, V.; Greer, J. F.; Hodges, M. B.; Pennybacker, P. V.

235. Structural Design (15 Men). *A (Excellent)* Hodges, T. A. *B (Good)* Eaheart, J.; Granger, A. T.; Park, D. E.; Petty, O. S.

241. Bridge Design (6 Men). No honors.

Drawing

15. Engineering Drawing (19 Men). *A (Excellent)* Kennedy, Ernest. *B (Good)* Fuller, Grady; Hobbs, Oscar; Trau, Frank.

106. Machine Design (18 Men). *A (Excellent)* Gadberry, J. L. *B (Good)* Callicut, J. M.; Franke, L. A.

113. Mechanical Design (4 Men). No honors.

201. Engineering Drawing (19 Men). *A (Excellent)* Bailey, D. P.; Bunsen, A.; Castle, W. R. *B (Good)* Archer, L. B.; Campbell, C.; Cox W.; Roberts, F. R.; Williams, R.

Electrical Engineering

20. Elements of Electrical Engineering (23 Men). *B (Good)* Seebe, A.; Zuhlke, Emil.

22. Alternating Current Machinery (22 Men). *B (Good)* Barfield, J. E.; Clark, C. W.; Harrison, W. H.; Naeter, A.; Wilmeth, R. H

28. Electrical Installations (6 Men). *B (Good)* Dale, R. H.; Delhomme, L. K.

32. Advanced Electrical Engineering (3 Men). *A (Excellent)* Delhomme, L. K. *B (Good)* Dale, R. H.

50. Research (1 Man). No honors.

105. Electrical Design (16 Men). *B (Good)* Clark, C. W.; Harrison, W. H.; Naeter, A.; Wilmeth, R. H.

108 s. Telephony (19 Men). *A (Excellent)* Beecroft, S. R.; Clark, C. W.; Withers, R. *B (Good)* Brooks, C. H.; Donaldson, C. A.; Hutchison, L. C.; O'Heim, C. L.; Franke, L. A.

202. Electrical Engineering Laboratory (20 Men). *B (Good)* Clark, C. W.; Harrison, W. H.; Naeter, A.; Wilmeth, R. H.

206. Electrical Applications (14 Men). *B (Good)* Clark, C. W.; Harrison, W. H.; Naeter, A.; Wilmeth, R. H.

221. Electrical Engineering Laboratory (21 Men). *A (Excellent)* Seebe, A.; Zuhlke, Emil. *B (Good)* Brooks, C. H.; Franke, L. A.; Wear, J. P.

231. Direct and Alternating Currents (11 Men). *A (Excellent)* Eaheart, J.; Nichols, M.; Petty, O. S. *B (Good)* Brown, N.

Mechanical Engineering

10. Heat Engines (15 Men). *B (Good)* Barfield, J. E.; Clark, C. W.; Harrison, W. H.; Matejka, J. V.; Naeter, A.; O'Heim, C. L.

101. Shop Work (65 Men). *A (Excellent)* Williams, E. J. *B (Good)* Archer, L. B.; Bunsen, A.; Castle, W. R.; Cole, S. D.; Cox, Walter; Gibson, E.; Grant, R. S.; Harris, J. E.; Inglish, E. C.; Newby, A.; Roberts, F. R.; Sands, Geo.; Slaton, D. L.; Williams, R.; Wynne, Byron; Zant, J. B.

102. Shop Work (36 Men). *B (Good)* Archer, O. B.; Burdett, R W.; Caldwell, J. H.; Harrison, W. H.; Haubold, E. G.; Lain, C. B.; O'Banion, A. L.; Wear, J. P.; Woods, D. E.

203. Thermodynamics (28 Men). *A (Excellent)* Wilmeth, R. H.

B (Good) Blair, W. C.; Clark, C. W.; Harrison, W. H.; Matejka, J.; Travers, N. E.

204. Heat Engines Laboratory (27 Men). *A (Excellent)* Wilmeth, R. H. *B (Good)* Naeter, A.

205. Machine Design (28 Men). *B (Good)* Barfield, J. E.; Hutchison, L.; Merrill, G. M.

206 Shop Work (4 Men). *B (Good)* Orr, C. L.

TABLES OF GRADES, SESSION OF 1916-17

COLLEGE OF ARTS

Name and Number of Course	Instructor's Initials	Total Registration in Thirds	No. of Passing Grades	Percentages of Passing Grades			
				A's	B's	C's	D's
APPLIED MATHEMATICS							
1 abc. F. Introductory Course for Engineers 1	C. D. R.	47	29	35	25	25	15
Introductory Course for Engineers 2	C. D. R.	72	42	12	29	31	29
Introductory Course for Engineers 3	H. J. E.	33	27	19	29	29	23
Introductory Course for Engineers 4	H. J. E.	80	46	13	30	35	22
1 ab. F. Introductory Course for Engineers (ws)	P. M. B.	49	23	0	9	39	52
1 Introductory Course		281	167	16	26	32	27
15. A. Advanced Calculus	P. M. B.	20	18	6	28	39	28
104f. I. Second Course in Analytics 1	H. J. E.	20	17	6	29	29	35
Second Course in Analytics 2	C. D. R.	29	16	13	13	27	47
Second Course in Analytics 3	P. M. B.	16	6	33	33	0	33
104 f. I. Second Course		65	38	13	24	24	39
207 fw. A. Advanced Calculus	C. D. R.	26	21	19	10	19	52
208. A. Advanced Calculus	H. J. E.	51	42	12	24	40	24
209ab. I. Calculus 1	H. J. E.	58	37	16	24	41	19
209ab. I. Calculus 2	C. D. R.	44	29	10	21	41	27
209 ab. I. Calculus		102	66	14	22	40	22
214 ws. I. Popular Astronomy	H. Y. B.	18	13	15	46	15	23
ASSOCIATION OF RELIGIOUS TEACHERS							
1. I. Fundamental Conceptions	R. F. G.	9	8	25	75	0	0
2. I. Life of Jewish Nation	T. W. C.	12	12	8	75	17	0
3. I. New Testament Outlines	R. L. G.	17	17	59	24	12	6
5. I. Outlines of Church History	H. K.	12	12	50	42	8	0
18. I. Christian Ethics	J. E. R.	8	8	0	50	50	0
104f. I. Social Ideals of Hebrews	H. K.	6	6	17	50	33	0
105w. I. Teachings of Jesus	H. K.	12	7	57	14	29	0
106s. I. Philosophy of Religion	H. K.	14	5	40	60	0	0
111s. I. Life and Letters of Paul	F. L. J.	15	15	33	47	20	0
112f. I. Ethics of Jesus	F. L. J.	20	20	10	65	25	0
114s. I. Social Message of Jesus	F. L. J.	42	39	23	58	13	5
118w. I. Social Message of Prophets	F. L. J.	37	31	24	35	32	9
206fw. I. Life of Christ	F. L. J.	24	20	40	45	5	10
BOHEMIAN							
1. I. Elementary Bohemian	C. K.	15	11	45	27	27	0
2. I. Intermediate Bohemian	C. K.	9	9	0	89	11	0
BOTANY							
1. F. Elementary Botany	L. M. Y.	354	252	12	34	33	22
21. I. Taxonomy of Seed Plants	M. S. Y.	6	5	0	60	20	20
27. A. Systematic Botany	M. S. Y.	12	12	33	33	25	8
29 & 29a. I. & A. Bacteriology	I. M. L.	68	61	34	44	21	0
42. G. Research Problems	I. M. L.	6	6	83	17	0	0
139. G. Botanical Seminary	I. M. L.	8	7	59	41	0	0
406. A. Histology and Cytology	I. M. L.	16	13	20	80	0	0
418. I. Elementary Plant Physiology	F. Mc.	56	44	33	21	40	6

COLLEGE OF ARTS—Continued

Name and Number of Course	Instructor's Initials	Total Registration in Thirds	No. of Passing Grades	Percentages of Passing Grades			
				A's	B's	C's	D's
BUSINESS ADMINISTRATION							
11. I. The Theory and Practice of Accounting 1	J. E. T.	72	47	23	30	36	11
The Theory and Practice of Accounting 2	S. B.	95	76	15	39	28	20
The Theory and Practice of Accounting 4	J. E. T.	57	43	14	26	33	28
11. I. The Theory of Accounting		224	166	17	32	31	19
12. A. Advanced Accounting	J. E. T.	63	53	15	38	36	11
23. I. Business ,Law	A. L. G.	191	166	7	47	41	5
24. A. Investments	J. A. D.	29	24	21	50	21	8
26. A. Foreign Trade	J. A. D.	28	21	43	33	19	5
110f. I. Business Principles	J. A. D.	11	9	33	44	11	11
121s. A. Cost Accounting	S. B.	10	7	14	29	57	0
123f. A. Accounting and Financial Problems	S. B.	4	4	0	25	75	0
124w. A. Government Accounting	S. B.	3	3	33	33	33	0
125s. A. Seminar	S. B.	4	4	0	50	50	0
127f. A. Property Insurance	J. A. D.	19	18	6	22	56	17
128f. A. Seminar	J. A. D.	2	2	100	0	0	0
218ws. I. Selling Problems	J. E. T.	81	58	16	28	36	21
221fw. A. Management of Business	S. B.	24	20	30	60	5	5
227ws. A. Banking Practice	J. A. D.	60	44	16	43	27	14
CHEMISTRY							
1. F. General Chemistry	E. P. S.	1468	1102	14	30	32	24
2. I. Chemical Analysis	H. W. H.	100	70	24	36	26	14
19. G. Advanced Organic Chemistry	J. R. B.	6	3	100	0	0	0
20. G. Advanced Physical Chemistry	E. P. S.	12	12	100	0	0	0
29. G. Physical Chemistry	E. P. S.	12	12	100	0	0	0
31. G. Organic Chemistry	J. R. B.	6	6	100	0	0	0
50. A. Elementary Physical Inorganic Chemistry	E. P. S.	33	32	43	43	10	3
104w. A. Assaying	H. W. H.	1	1	0	100	0	0
107. F. Descriptive Chemistry	E. P. S.	367	282	25	28	32	15
112. A. Organic Chemistry	J. R. B.	7	7	43	57	0	0
113f. A. Advanced Qualitative Analysis	E. P. S.	8	7	43	43	0	14
114. A. Inorganic Preparations	E. P. S.	3	3	33	67	0	0
115. A. Inorganic Preparations	E. P. S.	2	2	100	0	0	0
116. A. Quantitative Analysis	H. W. H.	3	0	*	*	*	*
126. A. Electro-Analysis	E. P. S.	3	0	*	*	*	*
411. A. Organic Chemistry	J. R. B.	68	60	27	49	11	13
440. I. Elementary Organic Chemistry	J R. B.	75	55	11	32	27	30
*Work unfinished account of war.							
ECONOMICS AND SOCIOLOGY							
1. I. Principles of Economics	A. B. W.	623	553	8	26	38	28
2. A. Corporation and Railway Economics	E. J.	75	59	14	37	27	22
3. A. Economic History of U. S	E. T. M.	27	26	23	38	31	8
6. I. Principles of Economics	E. J.	416	317	5	28	42	25
11. A. Public Finance	E. T. M.	43	41	17	49	22	12
12. A. Money, Banking, Crises	E. T. M.	120	104	14	38	31	16
13. A. Social Problems	A. B. W.	150	144	13	46	31	11
15. I. Outlines of Sociology	A. B. W.	57	42	19	24	31	26
17. A. Economic Problems	E. J.	21	18	50	22	22	6
19. A. Economic Statistics	H. H. P.	12	10	30	70	0	0
23. G. Problems of Population	A. B. W.	21	18	33	67	0	0
110f. A. Evolution of Economic Society	H. H. P.	22	21	29	48	14	10
116s. A. Economics of Agriculture	G. S. W.	14	6	0	100	0	0
214ws. A. The Labor Problem	H. H. P.	61	55	27	44	26	4

COLLEGE OF ARTS—Continued

	Name and Number of Course	Instructor's Initials	Total Registration in Thirds	No. of Passing Grades	Percentages of Passing Grades			
					A's	B's	C's	D's
	ENGLISH							
F.	Rhetoric and Composition 1	J. F. D.	76	46	0	11	41	47
	Rhetoric and Composition 2	S. R. A.	87	51	0	14	49	37
	Rhetoric and Composition 3	H. W. P.	81	54	6	33	41	20
	Rhetoric and Composition 4	D. & P.	68	37	9	30	39	23
	Rhetoric and Composition 5	F. & S.	78	36	13	20	37	31
	Rhetoric and Composition 6	A. A.	90	52	0	37	44	19
	Rhetoric and Composition 7	H. M. J.	73	50	10	48	32	10
	Rhetoric and Composition 8	S. T.	71	48	19	21	37	23
	Rhetoric and Composition 9	F. E. M.	71	42	2	21	45	31
	Rhetoric and Composition 10	R. H. G.	96	57	3	11	35	51
	Rhetoric and Composition 11	D. & P.	73	51	0	22	43	35
	Rhetoric and Composition 12	D. & P.	74	48	2	8	38	52
	Rhetoric and Composition 13	W. M. T.	79	55	11	29	45	15
	Rhetoric and Composition 14	L. & B.	87	64	16	17	31	36
	Rhetoric and Composition 15	H. D. W.	76	51	12	22	35	31
	Rhetoric and Composition 16	H. T. P.	59	31	19	29	26	26
	Rhetoric and Composition 17	T. & C.	58	41	2	17	41	39
	Rhetoric and Composition 18	H. D. W.	99	48	12	12	33	44
	Rhetoric and Composition 19	F. E. M.	58	39	11	17	44	28
	Rhetoric and Composition 20	H. M. E.	75	46	7	30	35	28
	Rhetoric and Composition 21	W. M. T.	53	38	0	11	29	60
	Rhetoric and Composition 23	H. D. W.	85	25	20	0	32	48
	Rhetoric and Composition 25	K. C.	69	59	7	27	27	39
	Rhetoric and Composition 26	T. & C.	68	45	0	16	35	49
	Rhetoric and Composition 27	W. S. S.	47	41	2	20	37	41
	Rhetoric and Composition 28	W. S. S.	47	44	2	28	30	32
	Rhetoric and Composition 29	H. W. P.	43	38	3	39	48	10
	Rhetoric and Composition 30	S. R. A.	37	24	8	21	38	34
	Rhetoric and Composition 31	J. T. T.	53	38	0	18	26	56
	Rhetoric and Composition 32	R. W. F.	57	45	5	20	42	33
	Rhetoric and Composition 33	W. M. T.	48	27	8	37	18	37
	Rhetoric and Composition 34	E. L. B.	75	42	5	26	38	36
	Rhetoric and Composition 35	S. T.	76	61	0	23	47	30
	Rhetoric and Composition 36	E. M. C.	40	24	8	17	34	42
	Rhetoric and Composition 37	J. F. D.	44	31	10	36	19	36
	Rhetoric and Composition 38	F. E. M.	76	48	0	35	48	17
	Rhetoric and Composition 40	F. E. M.	68	34	6	21	44	29
	Rhetoric and Composition 41	A. C. J.	72	47	8	21	36	34
	Rhetoric and Composition 43	E. L. B.	32	21	5	43	24	28
	Rhetoric and Composition 45	R. W. F.	28	17	18	29	23	29
	Rhetoric and Composition 47	F. & W.	71	20	10	15	35	40
1. F.	Rhetoric and Composition		2044	1728	6	23	37	34
2. I.	Outline History of English Literature 1	E. M. C.	77	43	7	16	33	44
	Outline History of English Literature 3	E. L. B.	103	70	3	29	37	31
	Outline History of English Literature 4	A. C. J.	80	71	7	24	35	33
	Outline History of English Literature 5	F. & E.	67	43	9	19	26	46
	Outline History of English Literature 6	F. & C.	67	45	7	7	36	50
	Outline History of English Literature 7	H. M. E.	72	57	23	16	30	31
	Outline History of English Literature 8	H. W. P.	104	85	11	39	43	8
	Outline History of English Literature 9	T. & D.	98	83	14	32	34	19
	Outline History of English Literature 10	S. T.	90	56	20	45	50	16
	Outline History of English Literature 11	S. & G.	98	78	10	30	43	18
	Outline History of English Literature 12	R. H. G.	62	40	9	20	50	22
	Outline History of English Literature 13	P. & A.	83	66	15	20	33	26
	Outline History of English Literature 14	P. & J.	52	32	6	28	47	19
	Outline History of English Literature 15	E. L. B.	89	59	13	25	24	34
	Outline History of English Literature 16	H. T. P.	96	69	14	27	41	18
	Outline History of English Literature 17	C. & W.	99	62	6	31	34	29
	Outline History of English Literature 18	R. A. L.	12	9	22	33	22	22
	Outline History of English Literature 19	S. R. A.	89	65	6	26	46	22

COLLEGE OF ARTS—Continued

	Name and Number of Course	Instructor's Initials	Total Registration in Thirds	No. of Passing Grades	Percentages of Passing Grades			
					A's	B's	C's	D's
	ENGLISH—Continued							
	Outline History of English Literature 21	W. S. S.	46	34	26	18	41	15
2. I.	Outline History of English Literature		1490	1068	11	27	36	26
3. I.	Composition 1	K. C.	47	30	13	43	15	29
	Composition 2	E. M. C.	58	38	16	18	45	21
	Composition 3	J. B. W.	49	32	9	28	44	19
	Composition 5	H. M. E.	68	49	16	29	45	10
3. I.	Composition		222	158	14	29	37	20
4. A.	History of English Language	M. C.	47	36	22	28	44	6
20. G.	Conference Course	M. C.	12	6	67	33	0	0
22. A.	Victorian Poetry	J. W. C.	54	51	14	21	45	20
31. A.	English Drama	J. F. R.	173	139	8	31	45	17
106s. A.	Milton	E. M. C.	43	19	16	37	37	11
108f. A.	Poetry of English Classical Period	R. H. G.	19	18	11	50	33	6
116s. G.	Modern English Grammar	M. C.	2	1	100	0	0	0
117f. A.	Beginnings of English Drama	M. C.	11	7	0	43	29	29
119f. A.	English Prose of Augustan Age	J. B. W.	32	25	12	24	36	28
124 w. A.	Elizabethan Poetry	L. W. P.	42	33	18	30	40	12
125. A.	English Composition	K. C.	17	13	23	54	23	0
126w. A.	English Drama from 1540 to Shakespeare	R. A. L.	28	20	15	30	35	20
127s. A.	English Drama from 1600 to 1642	H. T. P.	47	31	6	19	58	16
132ws. F.	English Literature 1	J. F. R.	36	29	10	30	45	7
	English Literature 2	J. F. R.	21	17	18	35	35	12
	English Literature 4	A. C. J.	24	17	6	41	47	6
132ws. F.	English Literature		81	63	11	30	43	8
133s. A.	Early Nineteenth Century Prose	E. L. B.	42	30	13	47	27	13
134s. A.	Chaucer	J. F. R.	44	34	6	24	55	15
136s. A.	American Prose	L. W. P.	50	47	17	56	28	0
205fw. A.	Shakespeare	R. A. L.	100	87	14	32	33	21
209ws. A.	The English Romantic Movement	R. H. G.	87	60	23	25	23	28
211fw. A.	American Poetry	K. C.	64	57	19	35	32	14
215fw. G.	Middle English	M. C.	3	2	100	0	0	0
235fw. A.	Contemporary English Poetry and Recent Novel	J. F. R.	118	104	9	32	40	19
	FRENCH							
A. F.	Composition and Reading 1	O. F. B.	79	39	15	28	28	28
	Composition and Reading 2	N. H. C.	108	59	12	17	30	42
	Composition and Reading 3	E. J. V.	134	92	14	20	39	27
	Composition and Reading 4	B. M. W.	118	91	12	23	33	32
	Composition and Reading 5	N. H. C.	38	28	7	36	36	21
	Composition and Reading 7	H. L. N.	74	46	16	18	47	19
A. F.	Composition and Reading		551	355	13	22	36	29
1. F.	Composition and Reading 1	H. L. N.	79	49	16	35	25	25
	Composition and Reading 2	N. H. C.	76	37	14	16	22	48
	Composition and Reading 3	H. L. N.	38	27	15	15	30	41
	Composition and Reading 4	O. F. B.	77	52	10	21	48	21
1. F.	Composition and Reading		270	165	13	23	32	31
2. I.	Composition, Reading, Literature 1	E. J. V.	81	71	10	27	36	27
	Composition, Reading, Literature 2	O. F. B.	77	59	17	24	42	17
	Composition, Reading, Literature 3	B. M. W.	43	33	18	33	33	15
2. I.	Composition, Reading, Literature		201	163	14	27	38	21
11. A.	Nineteenth Century Lyric Poetry	O. F. B.	35	31	42	42	18	0
17. A.	Phonetics and History	E. J. V.	35	32	6	47	31	16
18. A.	French Literature of 18th and 19th Centuries	B. M. W.	46	46	30	13	52	4
20. G.	Old French	E. J. V.	3	3	100	0	0	0

COLLEGE OF ARTS—Continued

	Name and Number of Course	Instructor's Initials	Total Registration in Thirds	No. of Passing Grades	Percentages of Passing Grades			
					A's	B's	C's	D's
	GENERAL LITERATURE							
1. A.	Tragedy	H. M. J.	257	214	8	32	45	15
9. A.	The Epic	H. M. J.	89	67	15	33	44	9
	GEOLOGY							
1. F.	General Geology 1	F. L. W.	198	157	14	45	35	6
	General Geology 2	H. P. B.	155	131	12	37	34	17
	General Geology 3	F. L. W.	145	120	17	45	27	11
	General Geology 4	H. P. B.	113	98	6	30	45	19
	General Geology 6	F. W. S.	94	89	10	54	26	10
1. F.	General Geology		705	595	12	42	33	12
2. I.	Historical Geology	F. W. S.	21	20	15	65	20	0
7. A.	Special Geology	F. W. S.	11	11	18	55	18	9
12. I.	Physiography of North America	F. W. S.	21	21	10	62	28	0
14. I.	Paleontology	F. L. W.	4	4	50	50	0	0
16. I.	Mineralogy	J. & T.	6	6	17	83	0	0
23. A.	Paleontology (Vertebrate and Invertebrate)	F. L. W.	6	6	50	50	0	0
24. A.	Economic Geology	J. & T.	9	6	83	17	0	0
27. I.	Field Geology	J. & B.	9	9	77	11	11	0
30. A.	Paleontological Research	F. L. W.	9	9	89	11	0	0
	Thesis	F. L. W.	3	3	100	0	0	0
	GERMAN							
A. F.	Beginners' German 1	P. & D.	90	59	7	29	32	32
	Beginners' German 2	M. D.	97	62	10	40	32	18
	Beginners' German 3	J. C. W.	85	66	9	29	27	35
	Beginners' German 4	L. M. S.	86	51	28	29	35	8
	Beginners' German 5	W. E. M.	81	47	15	47	25	13
	Beginners' German 6	J. L. B.	54	29	27	19	27	27
	Beginners' German 11	J. C. W.	65	53	30	28	30	12
A. F.	Beginners' German 13	J. A.	9	5	20	0	20	60
	Beginners' German 15	R. M. K.	62	43	14	28	37	21
A. F.	Beginners' German		629	415	17	31	31	21
1. F.	Composition and Reading 1	J. C. W.	77	52	10	32	34	24
	Composition and Reading 2	J. L. B.	59	29	31	10	27	31
	Composition and Reading 3	L. M. S.	65	29	14	18	24	44
	Composition and Reading 4	L. M. S.	44	21	10	19	57	14
	Composition and Reading 5	S. & K.	66	43	16	33	30	21
	Composition and Reading 6	von S.	4	3	0	33	0	67
	Composition and Reading 9	W. E. M.	46	20	10	5	60	25
	Composition and Reading 13	J. L. B.	62	46	22	15	45	18
	Composition and Reading 15	W. E. M.	54	15	20	47	33	0
	Composition and Reading 17	J. A.	39	23	0	30	22	48
1. F.	Composition and Reading		516	281	15	24	36	26
2. I.	Rapid Reading Course 1	K. M.	63	47	8	32	34	26
	Rapid Reading Course 2	W. E. M.	68	38	26	18	32	24
	Rapid Reading Course 3	L. M. S.	44	28	25	15	36	25
	Rapid Reading Course 4	J. A.	64	50	10	20	32	38
	Rapid Reading Course 5	J. A.	12	7	0	57	43	0
2. I.	Rapid Reading Course		251	170	15	24	34	28
8. A.	Schiller	K. M.	25	23	52	35	13	0
11. A.	Outline of German Literature	M. D.	78	68	30	40	21	10
22. I.	Elementary Composition and Conversation 2	P. & M.	49	36	28	36	22	14
	Elementary Composition and Conversation 4	J. L. B.	39	32	9	28	48	15
22. I.	Elementary Composition and Conversation		88	68	19	32	35	14

COLLEGE OF ARTS—Continued

Name and Number of Course	Instructor's Initials	Total Registration in Thirds	No. of Passing Grades	Percentages of Passing Grades			
				A's	B's	C's	D's
GERMAN—Continued							
31. G. Seminar	P. & M.	9	7	85	15	0	0
105. I. Colloquial Exercises 3	J. C. W.	6	5	19	38	31	12
120. A. Grammar Review	M. D.	13	10	30	40	30	0
122f. A. Phonetics	E. P.	7	7	57	43	0	0
123. A. Introduction to Philology	M. D.	26	20	25	55	20	0
124w. A. Historical German Grammar	E. P.	7	6	67	33	0	0
126f. G. Gothic A	E. P.	4	4	75	25	0	0
127w. G. Old High German	E. P.	4	4	50	50	0	0
130s. G. Advanced Old High German	K. M.	3	3	67	33	0	0
220. A. Advanced Practice	M. D.	29	23	24	21	35	21
GOVERNMENT							
1. I. Introduction to Government 1	C. G. H.	216	163	6	27	49	17
Introduction to Government 2	H. G. J.	127	93	4	30	53	13
1. I. Introduction to Government		343	256	5	29	49	16
4. I. Government	C. S. P.	319	240	11	44	35	10
15. A. Comparative Municipal Government	H. G. J.	53	52	12	73	15	0
18. G. Municipal Administration	H. G. J.	6	3	100	0	0	0
20. A. Comparative Constitutional Law	C. G. H.	15	15	33	67	0	0
22. A. State Government	C. G. H.	48	42	38	45	10	7
24. A. Governments of Foreign Countries	H. G. J.	9	9	11	56	33	0
27. G. Comparative Government	C. G. H.	12	12	100	0	0	0
119ws. A. Municipal Research	E. P.	1	1	100	0	0	0
123. A. American Diplomacy	C. G. H.	2	2	0	100	0	0
GREEK							
22. I. Attic Prose	W. J. B.	31	24	25	17	46	12
24. A. Beginnings of Poetry	G. M. C.	18	15	60	40	0	0
25. A. Development of Poetry	G. M. C.	10	9	85	15	0	0
31. A. New Testament Greek	D. A. P.	6	6	0	100	0	0
32. G. Homer	W. J. B.	6	1	100	0	0	0
40. A. Greek Poetry	D. A. P.	56	47	15	69	12	4
123. I. Greek Composition	G. M. C.	4	1	0	100	0	0
199s. I. Greek in English	W. J. B.	37	17	24	35	24	18
521. F. Beginners' Class	G. M. C.	127	85	35	35	12	18
HISTORY							
1. F. Ancient History	F. B. M.	253	188	7	23	49	30
2. F. History of Medieval Europe	F. D.	760	540	9	28	36	28
3. I. History of Modern Europe 1	T. W. R.	108	82	18	33	32	16
History of Modern Europe 2	T. W. R.	49	43	19	44	28	10
3. I. History of Modern Europe		157	125	18	37	30	14
4. I. History of England	W. R. M.	123	104	10	38	40	12
5. I. History of U. S. 1	D. B. R.	183	146	8	18	46	29
History of U. S. 2	D. B. R.	180	139	4	27	43	26
5. I. History of United States		369	285	6	22	44	28
7. A. Anglo-American Southwest	E. C. B.	15	9	67	0	33	0
8. A. Later U. S. History	C. W. R.	10	6	50	0	50	0
23. A. History of Europe Since 1815	T. W. R.	64	62	31	39	16	15
25. A. History of U. S., 1750-1829	E. C. B.	69	59	24	26	31	20
31. A. Greek Imperialism	F. B. M.	27	25	44	28	28	0
34. A. The British Empire	M. R. G.	53	46	17	43	26	13
35. A. History of U. S., 1829-1860	E. C. B.	135	123	16	41	30	12
36. A. Spanish Southwest	W. E. D.	12	9	0	67	33	0
45. A. Civil War	C. W. R.	47	44	14	34	39	14
46. A. History of Latin America	C. W. R.	49	48	17	40	44	0
64. A. English Diplomatic History	W. R. M.	44	35	23	54	29	0

COLLEGE OF ARTS—Continued

Name and Number of Course	Instructor's Initials	Total Registration in Thirds	No. of Passing Grades	Percentages of Passing Grades			
				A's	B's	C's	D's
HISTORY—Continued							
74. F. History of England	M. R. G.	627	432	12	26	37	25
142s. A. Beginnings of Renaissance	F. D.	19	17	24	41	18	18
195w. A. History of U. S., 1877-1897	C. W. R.	9	8	25	25	50	0
226. I. Spanish and French Colonization	W. E. D.	15	14	14	57	21	7
231ws. A. Medieval Society	F. D.	33	28	17	40	29	14
HOME ECONOMICS							
1. F. Introductory Course 1, 2, 6	A. C. R.	158	132	14	42	33	11
Introductory course 4	J. R. B.	82	64	16	41	34	10
8. A. Food Preparation	J. R. B.	22	21	5	62	24	10
11. I. Food Composition and Digestion	A. C. R.	41	38	13	36	42	8
15. I. Manufacture and Selection of Clothing	E. C. M.	106	92	17	67	11	4
113s. A. Nutrition	A. C. R.	3	3	0	100	0	0
114. I. Art Principles	F. A. S.	37	31	11	44	29	16
204fw. House Structure	F. A. S.	52	40	10	32	35	23
211ws. A. Home Economics	M. E. G.	13	12	17	33	42	8
212fw. Dietetics	A. C. R.	6	6	17	83	0	0
216fw. Design	F. A. S.	31	27	14	49	28	7
217fw. Costume	E. C. M.	16	15	40	47	7	7
INSTITUTIONAL HISTORY							
1. I. Elements of Institutional History	L. M. K.	123	104	33	35	22	11
2. A. Geography of Eastern Civilization	L. M. K.	36	32	53	41	6	0
7. G. Science of Civilization	L. M. K.	8	7	0	100	0	0
ITALIAN							
1. I. Composition and Reading	B. M. W.	45	37	41	22	27	11
JOURNALISM							
1. I. History of Journalism	W. H. M.	89	73	12	36	41	11
2. A. Comparative Journalism	W. H. M.	3	3	100	0	0	0
12. I. News Gathering and Reporting	V. L. B.	58	48	25	40	31	4
14. I. Copy Reading	V. L. B.	16	7	43	14	43	0
15. A. Editorial Writing	B. O. B.	33	24	38	33	25	4
16. A. Newspaper Technic	V. L. B.	9	9	33	44	22	0
22. I. Principles of Advertising	B. O. B.	34	28	11	54	29	7
23. A. Business Management	B. O. B.	3	3	100	0	0	0
31. I. Mechanics of Printing	V. B. C.	26	15	33	53	13	0
103. I. Newspaper Jurisprudence	W. H. M.	6	5	47	27	20	7
216ws. A. Magazine Making	V. B.	19	17	29	35	29	6
219ws. A. Feature Writing	V. B.	10	6	33	0	33	33
LATIN							
3. I. Reading Course 2	P. & F.	116	99	10	28	28	34
Reading Course 4	P. & F.	85	73	14	30	29	27
3. I. Reading Course		201	172	12	29	28	31
5. A. Reading Course	P. & F.	59	56	23	41	32	4
8. A. Reading Course	P. & F.	29	19	32	26	32	11
102f. F. Writing Course	R. L.	15	10	30	0	50	20
104. I. Writing Course	R. L.	26	21	10	33	48	10
106. A. Composition and Style	E. W. F.	8	5	0	80	20	0
109. A. Composition and Style	E. W. F.	2	1	0	100	0	0
215. G. Advanced Sanskrit	E. W. F.	4	0	—	—	—	—
401. F. Easy Reading Course 1	R. L.	97	56	14	32	29	25
Easy Reading Course 2	W. M. K.	83	64	17	23	31	28
Easy Reading Course 3	R. L.	65	55	15	33	33	20
401. F. Easy Reading Course		245	175	15	29	31	25

COLLEGE OF ARTS—Continued

Name and Number of Course	Instructor's Initials	Total Registration in Thirds	No. of Passing Grades	Percentages of Passing Grades			
				A's	B's	C's	D's
MATHEMATICS							
1. a. F. Plane Trigonometry 1	M. B. P.	53	33	24	21	24	31
Plane Trigonometry 2	M. B. P.	38	18	22	11	33	33
Plane Trigonometry 3	A. A. B.	22	7	0	14	42	42
Plane Trigonometry 4	M. E. D.	30	13	23	15	38	23
Plane Trigonometry 5	P. M. B.	34	14	14	7	57	21
Plane Trigonometry 6	J. W. C.	49	34	12	15	32	41
Plane Trigonometry 7	A. A. B.	17	10	0	0	60	40
Plane Trigonometry 8	H. Y. B.	33	24	17	25	33	25
Plane Trigonometry 9	W. G. L.	31	17	18	18	12	53
Plane Trigonometry 10	J. W. C.	40	30	17	33	40	10
Plane Trigonometry 11	G. P. H.	40	30	13	33	32	20
Plane Trigonometry 12	E. L. D.	29	20	20	20	35	25
Plane Trigonometry 13	M. E. D.	28	18	17	50	17	17
Plane Trigonometry 18	G. P. H.	33	19	10	26	47	16
Plane Trigonometry 25	P. M. B.	22	12	0	25	42	33
Plane Trigonometry 27	W. L. G.	27	19	11	16	11	63
1. a. F. Plane Trigonometry		526	318	15	23	33	30
1. eg. F. Solid Geometry 1	M. B. P.	86	62	16	21	21	42
Solid Geometry 2	M. B. P.	66	31	19	19	26	35
Solid Geometry 3	A. A. B.	59	41	12	22	39	27
Solid Geometry 4	M. E. D.	51	34	9	27	32	32
Solid Geometry 5	P. M. B.	55	30	10	27	50	13
Solid Geometry 6	J. W. C.	63	41	10	35	27	27
Solid Geometry 7	A. A. B.	59	43	16	21	40	23
Solid Geometry 9	W. G. L.	61	37	22	24	30	24
Solid Geometry 25	P. M. B.	100	44	14	32	34	20
1. eg. F. Solid Trigonometry		600	363	14	25	32	28
1. b. F. Advanced Algebra 8	H. Y. B.	29	22	18	14	36	32
Advanced Algebra 10	J. W. C.	35	27	15	26	37	22
Advanced Algebra 11	G. P. H.	54	36	11	36	44	8
Advanced Algebra 12	E. L. D.	39	20	5	25	30	40
Advanced Algebra 13	M. E. D.	27	23	38	31	23	8
Advanced Algebra 14	M. E. D.	31	22	18	36	32	14
Advanced Algebra 15	M. E. D.	30	22	32	45	5	18
Advanced Algebra 16	G. P. H.	24	18	11	28	39	22
Advanced Algebra 17	E. L. D.	22	14	0	36	50	14
Advanced Algebra 18	G. P. H.	27	14	14	29	43	14
Advanced Algebra 19	J. W. C.	23	16	12	44	31	13
Advanced Algebra 21	G. P. H.	31	19	16	47	32	5
Advanced Algebra 27	W. G. L.	24	17	12	6	18	65
1. b. F. Advanced Algebra		396	260	15	31	33	21
1. c. F. Introduction to Analytic Geometry 8	H. Y. B.	35	25	12	32	36	20
Introduction to Analytic Geometry 10	J. W. C.	24	19	26	21	31	22
Introduction to Analytic Geometry 11	G. P. H.	62	33	12	37	33	18
Introduction to Analytic Geometry 12	E. L. D.	37	22	14	32	32	23
Introduction to Analytic Geometry 13	M. E. D.	27	15	20	53	27	0
Introduction to Analytic Geometry 14	M. E. D.	31	19	32	26	26	16
Introduction to Analytic Geometry 15	M. E. D.	34	22	27	50	14	9
Introduction to Analytic Geometry 16	G. P. H.	25	17	0	47	41	12
Introduction to Analytic Geometry 17	E. L. D.	21	14	21	29	43	7
Introduction to Analytic Geometry 18	G. P. H.	30	15	13	27	40	20
Introduction to Analytic Geometry 19	J. W. C.	29	23	17	30	43	9
Introduction to Analytic Geometry 21	G. P. H.	31	16	25	38	25	12
Introduction to Analytic Geometry 27	W. L. G.	28	12	25	8	8	58
1. c. F. Introduction to Analytic Geometry		414	252	19	34	32	17
1. d. F. Analytic Geometry 14	M. E. D.	30	20	25	30	35	10
Analytic Geometry 15	M. E. D.	34	21	33	29	19	19
Analytic Geometry 16	G. P. H.	27	17	18	29	53	0
Analytic Geometry 17	E. L. D.	21	12	8	42	33	17
Analytic Geometry 19	J. W. C.	26	18	28	39	28	6

COLLEGE OF ARTS—Continued

Name and Number of Course	Instructor's Initials	Total Registration in Thirds	No. of Passing Grades	Percentages of Passing Grades			
				A's	B's	C's	D's
MATHEMATICS—Continued							
Analytic Geometry 21	G. P. H.	34	16	20	38	20	22
1. d. F. Analytic Geometry		172	104	23	33	31	13
3. I. Calculus	J. W. C.	115	84	12	33	33	22
9. I. Investment and Life Insurance	E. L. D.	47	35	20	31	29	20
10. A. Introduction to Modern Analytic Geometry	M. B. P.	27	25	28	28	16	28
11. A. Advanced Calculus	M. B. P.	30	30	37	63	0	0
13. G. Advanced Mathematics	M. B. P.	12	12	100	0	0	0
17. G. Fourier's Series	J. W. C.	9	5	60	40	0	0
20. A. Probability	E. L. D.	18	18	72	28	0	0
115s. I. Solid Analytic Geometry	M. B. P.	19	14	50	29	14	7
215fw. I. Plane Analytic Geometry	M. B. P.	78	34	15	29	24	32
15. 1. Plain and Solid Geometry	M. B. P.	12	11	55	27	9	9
MUSIC							
1. F. Harmony and Melody	F. L. R.	56	51	27	45	27	0
2. I. Advanced Harmony and Counterpoint	F. L. R.	26	19	63	21	16	0
5. I. History of Music	F. L. R.	51	40	7	30	40	23
104. I. University Chorus	F. H. S.	48	29	67	33	0	0
106. I. Ensemble Playing	F. L. R.	14	13	38	46	15	0
PHILOSOPHY AND PSYCHOLOGY							
9. A. History of Philosophy	A. P. B.	36	30	47	30	20	3
20. G. Seminary	A. P. B.	5	3	0	100	0	0
23. A. Logic and Epistemology	S. P. W.	6	6	0	50	50	0
27. G. Research	A. P. B.	3	3	100	0	0	0
28. A. Ethics	A. P. B.	21	21	24	43	29	5
102. w. I. Logic	S. P. W.	90	81	21	35	26	18
102s. I. Logic	S. P. W.	7	6	17	33	33	17
103s. I. Ethics	C. S. Y.	73	66	9	41	40	10
104f. I. Introduction to Philosophy	A. P. B.	71	65	15	36	34	14
119w. A. British Philosophy	S. P. B.	2	2	50	0	50	0
205ws. I. Philosophy in Relation to Literature	A. P. B.	53	45	20	44	27	9
27. G. Research	C. S. Y.	6	6	100	0	0	0
51. A. Advanced Psychology	C. S. Y.	11	11	73	27	0	0
101f. I. Introductory Psychology 2	C. S. Y.	134	119	10	24	40	26
Introductory Psychology 4	A. G. B.	27	25	12	40	36	12
101f. I. Introductory Psychology		161	144	10	28	39	23
108w. A. Abnormal Psychology	C. S. Y.	10	10	20	70	10	0
114. A. Social and Applied Psychology	C. S. Y.	13	13	23	54	15	8
118f. A. Instinct and Emotion	C. S. Y.	10	10	40	30	30	0
142w. I. Sensation	B. & Y.	26	23	17	40	30	13
142s. I. Sensation	B. & Y.	24	22	18	41	32	9
PHYSICS							
1. F. General Physics 1	W. T. M.	742	411	18	38	30	14
General Physics 2	W. T. M.	461	294	15	36	35	14
1. F. General Physics		1203	705	17	37	32	14
4. A. Electricity and Magnetism	W. T. M.	21	19	21	42	11	26
33. A. Light and Photography	J. M. K.	10	7	43	0	57	0
35. A. Elementary Mechanics	L. M. B.	13	10	50	30	20	0
43. A. Spectroscopy	J. M. K.	9	7	86	14	0	0
109f. Physics	J. M. K.	4	4	25	75	0	0
116s. A. Precision of Measurements	L. M. B.	3	3	33	33	33	0
117 f. A. Vibratory Motion	S. L. B.	8	8	50	50	0	0
128f. A. High Temperature Measurements	S. L. B.	5	5	60	40	0	0
129. A. Seminary	J. M. K.	5	5	0	100	0	0

COLLEGE OF ARTS—Continued

	Name and Number of Course	Instructor's Initials	Total Registration in Thirds	No. of Passing Grades	Percentages of Passing Grades			
					A's	B's	C's	D's
	PHYSICS—Continued							
134. A.	Terrestrial Magnetism	J. M. K.	9	8	25	75	0	0
137s. A.	Experimental Electric Waves	S. L. B.	2	2	100	0	0	0
211ws.	Physics	J. M. K.	8	8	50	50	0	0
218ws. A.	Varying Currents	W. T. M.	2	2	100	0	0	0
227ws. A.	Electric Waves	S. L. B.	14	14	64	36	0	0
231. A.	Electrical Measurements	L. M. B.	37	26	38	43	15	3
422. I.	Mechanics, Electricity, Heat	S. L. B.	232	155	12	20	33	35
	PUBLIC SPEAKING							
15. A.	Seminary in Public Speaking	W. H. M.	37	27	22	67	11	0
104f. I.	Advanced Debate	C. I. F.	5	3	0	67	33	0
105. F.	Reading and Speaking 1	W. R. D.	30	24	26	42	28	4
	Reading and Speaking 3	W. H. M.	22	17	6	29	51	14
	Reading and Speaking 4	W. R. D.	43	30	19	47	26	8
	Reading and Speaking 5	W. R. D.	41	28	20	36	38	6
	Reading and Speaking 6	W. H. M.	18	14	10	36	46	7
105. F.	Reading and Speaking		153	113	16	39	37	8
109f. I.	Extempore Speaking 2	C. I. F.	10	9	44	22	22	11
	Extempore Speaking 3	W. R. D.	16	15	13	60	27	0
	Extempore Speaking 5	W. H. M.	7	7	57	14	29	0
109f. I.	Extempore Speaking		33	31	32	39	26	3
114f. I.	Oral Reading	W. R. D.	23	23	17	83	0	0
115w. I.	Oral Composition	W. R. D.	29	22	36	64	0	0
116s.	Argumentation	W. R. D.	34	27	41	41	18	0
208ws. I.	Oratory 2	W. H. M.	15	13	15	54	31	0
208ws. I.	Oratory 6	W. H. M.	16	10	40	60	0	0
208ws. I.	Oratory		31	23	26	57	17	0
210fw. I.	Debate 1	W. H. M.	25	24	29	50	21	0
	Debate 2	C. I. F.	14	13	0	31	46	23
210ws. I.	Debate 1	C. I. F.	24	22	18	23	45	14
	Debate 3	C. I. F.	40	31	13	42	36	10
210. I.	Debate		103	90	17	37	36	10
	RUSSIAN							
1. I.	Elementary Russian	C. K.	14	11	27	73	0	0
	SPANISH							
A. F.	Beginners' Spanish 1	C. B.	131	78	10	15	38	38
	Beginners' Spanish 2	E. & Z.	118	80	13	30	31	26
	Beginners' Spanish 3	C. B.	109	69	1	12	48	39
	Beginners' Spanish 4	E. & Z.	101	68	10	31	35	24
	Beginners' Spanish 5	L. M. C.	138	74	19	27	38	17
	Beginners' Spanish 6	N. W.	113	89	22	19	32	26
	Beginners' Spanish 7	M. K. K.	140	83	14	19	38	28
	Beginners' Spanish 9	W. S. H.	108	75	15	32	31	23
	Beginners' Spanish 11	E. R. S.	72	44	14	30	43	14
	Beginners' Spanish 13	S. & Z.	63	34	12	35	44	9
	Beginners' Spanish 15	M. K. K.	119	48	18	21	29	31
A. F.	Beginners' Spanish		1212	742	13	24	37	26
1. F.	Grammar, Reading, Composition 1	E. R. S.	136	78	1	10	60	30
	Grammar, Reading, Composition 2	W. S. H.	132	99	9	17	35	39
	Grammar, Reading, Composition 3	C. B.	119	81	11	21	29	39
	Grammar, Reading, Composition 4	S. E.	111	80	14	23	35	29
	Grammar, Reading, Composition 5	L. M. C.	54	39	5	5	50	40
	Grammar, Reading, Composition 6	N. W.	47	39	18	13	36	33
1. F.	Grammar, Reading, Composition		599	416	9	16	40	35
2. I.	Contemporary Literature 1	L. M. C.	122	78	13	40	30	17

COLLEGE OF ARTS—Continued

Name and Number of Course	Instructor's Initials	Total Registration in Thirds	No. of Passing Grades	Percentages of Passing Grades			
				A's	B's	C's	D's
SPANISH—Continued							
Contemporary Literature 3	N. W.	93	68	16	20	38	26
2. I. Contemporary Literature		215	146	14	31	34	21
8. A. Spanish Classical Prose	L. M. C.	34	26	46	46	8	0
16. A. History of Spanish Literature	W. S. H.	27	24	54	29	13	4
17. G. Old Spanish	L. M. C.	5	5	60	40	0	0
20. G. Conference Course	L. M. C.	3	3	100	0	0	0
22. I. Conversation and Composition 1	E. R. S.	110	86	19	17	50	15
Composition 2	N. W.	81	53	6	19	42	34
22. I. Conversation and Composition		191	139	14	18	47	21
ZOOLOGY							
1. F. General Zoology	D. B. C.	546	424	6	36	42	16
3. F. Invertebrate Zoology	D. B. C.	12	11	27	9	55	9
4. I. Vertebrate Zoology	T. S. P.	118	110	16	29	41	14
7. A. Advanced Zoology	J. T. P.	9	8	25	38	37	0
16. F. General Physiology and Hygiene	C. H.	357	287	9	31	40	19
29. G. Cytology	J. T. P.	6	6	83	17	0	0
104f. I. Principles of Zoology	J. T. P.	12	8	13	50	25	12
105w. I. Organic Evolution	D. B. C.	49	42	24	17	40	19
106s. I. Heredity	D. B. C.	45	39	8	38	51	13
108. A. Zoological Seminary	J. T. P.	8	6	50	0	50	0
125w. A. Evolution	D. B. C.	14	14	57	21	7	14
126s. A. Genetics	J. T. P.	13	13	46	23	31	0
128. A. Zoological Seminary	J. T. P.	4	4	25	75	0	0
410. A. Cellular Biology	J. T. P.	61	57	16	35	42	7
412. G. Problems in Vertebrate Zoology	J. T. P.	12	12	87	13	0	0

DEPARTMENT OF EDUCATION

Name and Number of Course	Instructor's Initials	Total Registration in Thirds	No. of Passing Grades	Percentages of Passing Grades			
				A's	B's	C's	D's
AGRICULTURAL EDUCATION							
1. F. Beginner's Agriculture	F. & B.	78	56	2	25	29	44
5. A. Soils, Soil Fertility, etc	C. P. B.	17	17	24	53	0	24
6. A. Field Crops	C. P. B.	14	14	29	57	7	7
11. I. Animal and Poultry Husbandry	N. E. F.	8	6	50	50	0	0
EDUCATION							
5. A. History of Education 1	F. E.	133	126	10	46	36	9
History of Education 2	F. E.	48	41	15	49	27	10
5. A. History of Education		181	167	11	47	34	9
17. A. The Philosophy of Education	A. C. E.	20	20	55	45	0	0
21. A. Seminary	W. S. S.	35	30	10	80	7	3
22. A. Seminary in Psychology of Education	A. C. E.	36	36	36	42	17	6
27. A. Practice Teaching	J. L. H.	114	111	25	49	23	3
45. I. History of Educational Reforms	B. F. P.	93	84	12	36	42	11
58. G. Problems in Education	L. W. S.	21	18	72	28	0	0
104s. I. Psychology of Development 1	A. C. E.	42	36	17	36	42	6
Psychology of Development 2	L. W. S.	37	31	19	41	31	10
Psychology of Development 4	F. E.	30	28	18	25	39	18
Psychology of Development		109	95	18	35	38	9
118f. A. Secondary Education	J. L. H.	11	10	10	50	40	0
120. w. A. Secondary Education	J. L. H.	10	8	25	50	25	0
121s. A. Secondary Education	J. L. H.	9	7	29	71	0	0
124w. I. Teachers' Course in Latin	R. L.	5	5	40	60	0	0
129. A. Teachers' Course in History	F. D.	12	7	71	29	0	0
136s. A. Teachers' Course in German	K. M.	4	4	50	50	0	0
141f. F. Educational Psychology 1	B. F. P.	51	43	5	28	49	19
Educational Psychology 2	C. T. G.	37	20	15	25	40	20
141w. F. Educational Psychology 1	B. F. P.	55	35	3	17	66	14
141w. F. Educational Psychology 2	C. T. G.	52	44	11	23	34	32
141s. F. Educational Psychology 1	C. T. G.	40	34	6	38	44	12
141fws. F. Educational Psychology		235	176	8	27	46	20
142f. F. Principles of Teaching 1	C. T. G.	50	40	0	15	75	10
142f. F. Principles of Teaching 3	C. T. G.	48	33	3	18	58	21
142w. F. Principles of Teaching 2	C. T. G.	26	25	16	32	28	24
142s. F. Principles of Teaching 1	C. T. G.	46	42	2	33	50	14
142s. F. Principles of Teaching 2	B. F. P.	38	37	3	32	46	18
142fws. F. Principles of Teaching		209	177	4	26	52	16
143f. F. School and Class Management 2	B. F. P.	30	24	0	50	33	17
School and Class Management 4	W. S. S.	24	20	10	30	30	30
143w. F. School and Class Management 1	W. S. S.	45	35	11	29	43	17
143w. F. School and Class Management 3	B. F. P.	50	31	16	32	42	10
143s. F. School and Class Management 1	W. S. S.	31	23	8	26	39	26
143s. F. School and Class Management 2	B. F. P.	35	32	9	38	44	9
143fws. F. School and Class Management		215	165	10	34	39	17
165. I. Physical Education	L. H. W.	6	3	33	67	0	0
169. A. Psychology and Pedagogy of Adolescent Groups	L. W. S.	7	6	50	50	0	0
173f. A. Mental Tests	T. L. K.	3	3	33	67	0	0
174s. A. Mental Measurements	T. L. K.	1	1	100	0	0	0
176w. A.	T. L. K.	1	1	100	0	0	0
203fw. I. Psychology of Education 1	A. C. E.	85	67	7	35	41	18
203fw. I. Psychology of Education 2	L. W. S.	74	69	6	39	45	10
203fw. I. Psychology of Education 4	T. L. K.	65	52	17	29	29	25
203fw. I. Psychology of Education		224	188	10	35	38	18
227ws. A. Practice Teaching	M. E. G.	12	11	0	55	36	9
234. ws. A. Psychology of Education	L. W. S.	19	17	53	23	23	0
254, 155. A. Seminary in History of Education	F. E.	61	58	17	57	26	0
Physical Education 1 (for men)	W. & B.	31	28	0	18	68	14

DEPARTMENT OF ENGINEERING

Name and Number of Course		Instructor's Initials	Total Registration in Thirds	No. of Passing Grades	Percentages of Passing Grades			
					A's	B's	C's	D's
ARCHITECTURE								
20.	F. Instrumental Drawing	E. M. F.	43	34	24	38	26	12
22.	I. Architectural Design	S. E. G.	44	37	8	67	16	8
23.	I. Architectural Design	S. E. G.	27	23	13	74	0	13
24.	I. Architectural Design	S. E. G.	18	17	0	12	41	47
28.	Building Construction	F. E. G.	18	15	20	60	20	0
30.	Building Construction	F. E. G.	12	9	22	56	11	11
35.	Architectural Design	S. E. G.	6	5	0	60	40	0
101.	F. Free-hand Drawing	R. E.	22	15	11	53	29	7
102.	Free-hand Drawing	R. E.	19	17	16	43	29	12
103.	Free-hand Drawing	R. E.	10	8	17	39	35	9
104.	Free-hand Drawing	S. E. G.	9	9	8	62	19	12
112.	Architectural History	S. E. G.	16	12	20	31	29	20
121f.	Working Drawings	F. E. G.	13	11	45	27	9	19
125.	Architectural Rendering	R. E.	12	10	7	37	40	17
126.	Architectural History	S. E. G.	10	9	38	34	7	21
131.	Building Sanitation	F. E. G.	6	5	25	50	25	0
137.	Freed-hand Drawing	R. E.	5	4	25	33	42	0
138.	Free-hand Drawing	S. E. G.	4	4	17	58	17	8
139.	History of Sculpture and Painting	R. E.	9	8	25	25	38	12
150.	Research in Architecture	F. E. G.	1	1	0	100	0	0
206.	F. Shades, Shadows, Perspective	R. E.	42	28	19	30	28	23
222.	Architectural Design	S. E. G.	1	1	0	100	0	0
227.	Building Construction	F. E. G.	18	16	35	43	22	0
229.	Building Sanitation	F. E. G.	17	13	10	55	30	5
236.	Architectural Design	S. E. G.	4	4	0	20	80	0
CIVIL ENGINEERING								
30.	Railroad Engineering	E. C. H. B.	90	63	19	22	33	25
31.	Structures	A. A. C.	45	29	14	38	24	24
32.	Applied Mechanics 1	T. U. T.	98	66	21	18	38	23
	Applied Mechanics 3	S. P. F.	45	22	18	36	14	32
32.	Applied Mechanics		143	88	20	22	32	25
101f.	Highway Engineering	R. G. T.	31	27	22	37	33	8
101w.	Highway Engineering	R. G. T.	4	3	0	33	67	0
101s.	High Engineering	R. G. T.	9	7	43	14	29	14
101fws.	Highway Engineering		44	37	24	32	35	8
102.	F. Plane Surveying	T. U. T.	17	15	33	47	17	4
103f.	F. Descriptive Geometry 1	S. P. F.	9	3	67	0	0	33
103f.	F. Descriptive Geometry 2	A. A. C.	4	2	50	0	0	50
103w.	F. Descriptive Geometry	R. G. T.	24	10	10	40	30	20
103s.	F. Descriptive Geometry	R. G. T.	7	3	33	33	0	33
103fws.	Descriptive Geometry		44	18	28	28	17	28
107.	Geodetic Surveying	E. C. H. B.	9	8	25	21	42	12
113w.	Masonry Construction	E. C. H. B.	15	15	7	27	33	33
115f.	Sanitary Engineering	R. G. T.	10	9	11	33	56	0
116w.	Water Supply Engineering	T. U. T.	14	13	31	38	31	0
117f.	Structures	A. A. C.	5	4	0	50	50	0
118w.	Stresses in Complex Structures	S. P. F.	4	2	50	50	0	0
119.	F. Field Work	E. C. H. B.	19	14	5	35	44	16
126s.	Mechanics 1	A. A. C.	31	15	13	20	13	53
126s.	Mechanics 2	E. C. H. B.	45	18	17	44	28	11
126s.	Mechanics		76	33	15	33	21	31
128.	Laboratory Work	S. P. F.	46	34	8	24	43	25
129.	Field Work	E. C. H. B.	9	8	0	0	87	13
133s.	Reinforced Concrete	T. U. T.	10	8	38	50	12	0
136	w. Surveying for E. E. 1	A. A. C.	12	9	0	22	44	33
136	w. Surveying for E. E. 2	E. C. H. B.	9	4	0	50	25	25
136w.	Surveying for E. E.		21	13	0	31	38	31
137s.	Theory of Economic Railway Location	E. C. H. B.	14	13	23	38	15	23

DEPARTMENT OF ENGINEERING—Continued

	Name and Number of Course	Instructor's Initials	Total Registration in Thirds	No. of Passing Grades	Percentages of Passing Grades			
					A's	B's	C's	D's
	CIVIL ENGINEERING—Continued							
138s.	Labaratory	S. P. F.	4	1	0	0	0	100
139.	Sophomore Field Work	E. C. H. B.	29	22	0	31	46	23
140.	Senior Field Work	E. C. H. B.	2	1	0	33	67	0
148.	Highway Laboratory	R. G. T.	19	16	47	33	12	8
149.	Highway Bridges	R. G. T.	10	9	22	44	22	11
235.	Structural Design	A. A. C.	29	23	14	31	31	23
241.	Bridge Design	A. A. C.	11	9	14	14	29	43
	DRAWING							
15. F.	Engineering Drawing	C. E. R.	48	34	21	23	41	15
106.	Machine Drawing	C. E. R.	15	11	12	28	50	10
113.	Mechanical Drawing	C. E. R.	3	2	0	0	40	60
201. F.	Engineering Drawing	C. E. R.	120	86	9	19	37	35
	ELECTRICAL ENGINEERING							
20.	Elements of Electrical Engineering	J. W. R.	64	35	11	28	34	26
22.	Alternating Current Machinery	J. A. C.	62	43	9	33	31	28
28.	Electrical Installations	J. M. B.	18	15	20	27	40	13
32.	Advanced Electrical Engineering	J. M. B.	9	9	44	44	11	0
50.	Research in Electrical Engineering	J. M. B.	3	0	—	—	—	—
105.	Electrical Design	J. A. C.	15	9	19	35	22	22
108s.	Telephony	J. W. R.	19	13	31	46	8	15
202.	E. E. Laboratory	J. A. C.	40	32	8	25	33	33
206.	Electrical Applications	J. A. C.	27	17	19	35	22	22
221.	E. E. Laboratory	J. W. R.	37	25	24	29	21	26
231.	Direct and Alternating Currents	J. W. R.	22	19	32	21	43	4
	MECHANICAL ENGINEERING							
10.	Heat Engines	H. C. W.	45	36	0	50	33	17
101. F.	Shop Work 1	O. R. M.	21	19	19	40	31	10
	Shop Work 3	O. R. M.	21	14	12	35	35	18
	Shop Work 5	O. R. M.	20	15	13	38	24	24
101. F.	Shop Work		61	48	13	40	31	17
102.	Shop Work 2	C. R. M.	13	10	13	55	29	3
	Shop Work 4	O. R. M.	16	9	11	49	22	18
	Shop Work 6	O. R. M.	3	3	27	0	9	64
102.	Shop Work		32	22	14	45	23	18
203.	Thermodynamics	H. C. W.	55	40	15	25	37	23
204.	Heat Engines Laboratory	H. C. W.	47	34	18	18	39	25
205.	Machine Design	H. C. W.	55	31	6	30	43	21
206.	Machine Design	H. C. W.	7	7	0	50	0	50

DEPARTMENT OF LAW

Name and Number of Course	Instructor's Initials	Total Registration in Three	No. of Passing Grades	Percentages of Passing Grades			
				A's	B's	C's	D's
S Administration of Estates AB fw	W. S. S.	87	83	37	35	22	6
M Agency f	I. P. H.	218	184	34	48	16	2
J American Elementary Law f	J. C. T.	270	204	6	36	37	21
S Bankruptcy f	R. E. C.	77	70	7	40	39	14
M Carriers A w	E. W. P.	59	47	13	30	38	19
M Carriers B s	E. W. P.	55	45	18	38	22	22
S Conflict of Laws s	G. C. B.	20	19	11	37	37	16
M Commercial Paper w	I. M.	101	99	44	32	19	5
S Constitutional Law f	I. M.	172	172	55	35	7	5
J Contracts ABC fws	I. P. H.	456	359	27	33	33	7
S Conveyancing AB fw	I. M.	33	25	58	39	3	0
J Criminal Law AB	A. L. G.	282	160	3	15	49	33
J Criminal Procedure s	A. L. G.	124	85	7	27	27	39
M Damages w	A. L. G.	25	20	5	35	45	15
M Domestic Relations s	A. L. G.	86	72	1	22	37	40
S Equity AB ws	W. S. S.	199	176	8	42	37	14
M Evidence AB fw	B. D. T.	235	223	40	35	20	5
S Federal Courts s	W. S. S.	66	66	9	46	39	6
M Insurance f	E. W. P.	20	14	21	21	36	21
S International Law ABC fws	G. C. B.	169	161	12	46	30	12
S Jurisprudence s	J. T. T.	18	18	17	11	28	44
J Law Books f	A. L. G.	169	104	4	20	37	39
M Mining Law AB ws	W. M. C.	23	17	18	35	29	18
M Mortgages s	E. W. P.	88	61	10	13	34	43
S Municipal Corporations AB ws	I. M.	123	123	70	25	2	2
M Partnership w	I. P. H.	86	75	15	44	36	5
M Personal Property AB fw	E. W. P.	85	60	25	22	35	18
J Pleading AB ws	R. E. C.	384	319	7	33	41	42
M Practice AB fw	R. E. C.	249	208	5	32	49	14
S Practice Court ABC fws	R. E. C.	259	251	82	18	0	0
S Private Corporations AB ws	I. P. H.	243	237	34	41	20	5
S Public Utilities AB fw	J. C. T.						
S Public Utilities AB fw	J. C. T.	51	49	2	37	37	24
M Quasi-Contracts f	W. M. C.	12	9	11	33	22	33
M Real Property AB ws	B. D. T.	269	247	36	35	21	8
S Roman Law ABC fws	G. C. B.	11	8	50	50	0	0
M Sales AB ws	E. W. P.	27	19	39	48	4	9
M Suretyship and Guaranty s	I. M.	115	93	53	26	16	5
J Torts AB ws	J. C. T.	331	257	2	16	39	43
S Wills f	B. D. T.	53	47	3	37	46	14

SUMMARY, 1916-1917

Total Enrollment and Amounts Passed in Thirds of a Full Course

COLLEGE OF ARTS

	Freshman		Intermediate		Advanced		Total	
	Enrolled	Passed	Enrolled	Passed	Enrolled	Passed	Enrolled	Passed
Applied Mathematics	281	167	185	117	97	81	563	365
Bible	0	0	228	200	0	0	228	200
Bohemian	0	0	24	20	0	0	24	20
Botany	354	252	124	110	42	38	520	400
Business Administration	0	0	507	399	236	200	743	599
Chemistry	1,835	1,384	175	125	164	145	2,174	1,654
Economics	0	0	1,096	912	566	502	1,662	1,414
English	2,727	1,751	1,712	1,226	1,035	820	5,474	3,837
French and Italian	821	520	246	200	119	112	1,186	832
Geology	705	595	61	60	38	35	804	690
German	1,145	678	345	243	205	175	1,695	1,114
Government	0	0	662	496	146	136	808	632
Greek	127	85	72	42	96	78	295	205
History	1,640	1,160	664	528	586	519	2,890	2,207
Home Economics	240	196	289	249	38	36	567	481
Institutional History	0	0	123	104	44	39	167	143
Journalism	0	0	229	176	77	62	306	238
Latin	260	185	227	193	102	81	589	459
Mathematics	2,108	1,297	259	167	108	101	2,475	1,565
Music	56	51	139	101	0	0	195	152
Philosophy	0	0	294	263	71	65	365	328
Psychology	0	0	211	189	50	50	261	239
Physics	1,203	705	232	155	149	128	1,584	988
Public Speaking	153	113	258	219	37	27	448	359
Russian	0	0	14	11	0	0	14	11
Spanish	1,811	1,158	406	285	69	58	2,286	1,501
Zoology	903	711	236	210	127	120	1,266	1,041
COLLEGE OF ARTS	16,369	11,066	9,018	7,000	4,548	3,889	29,935	21,955
DEPARTMENT OF EDUCATION	737	574	476	409	588	546	1,801	1,529

SUMMARY, 1916-1917

Total Enrollment and Amounts Passed in Thirds of a Full Course

DEPARTMENT OF ENGINEERING

	Freshman		Intermediate		Advanced		Total	
	Enrolled	Passed	Enrolled	Passed	Enrolled	Passed	Enrolled	Passed
Architecture	107	77	48	40	231	198	386	315
Civil Engineering	80	47	260	168	399	290	739	505
Drawing	168	120	18	13	0	0	186	133
Electrical Engineering	0	0	0	0	316	217	316	217
Mechanical and Mining Engineering	61	48	32	22	209	148	302	218
DEPARTMENT OF ENGINEERING	416	292	358	243	1,155	853	1,929	1,388

DEPARTMENT OF LAW

	Freshman		Intermediate		Advanced		Total	
	Enrolled	Passed	Enrolled	Passed	Enrolled	Passed	Enrolled	Passed
Junior Law	0	0	2,016	1,488	0	0	2,016	1,488
Middle Law	0	0	0	0	1,752	1,493	1,752	1,493
Senior Law	0	0	0	0	1,671	1,505	1,671	1,505
DEPARTMENT OF LAW	0	0	2,016	1,488	3,423	2,998	5,439	4,486
TOTAL, MAIN UNIVERSITY	17,522	11,932	11,868	9,140	9,714	8,286	39,104	29,358

B130-817-15h

University of Texas Bulletin

No. 1737: July 1, 1917

Brief History of the Regulation of Fraternities in the University of Texas

BY

H. T. PARLIN

Chairman of the Faculty Committee on Student Social Organizations

Published by the University six times a month and entered as second-class matter at the postoffice at AUSTIN, TEXAS

The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston

Cultivated mind is the guardian genius of democracy. . . . It is the only dictator that freemen acknowledge and the only security that freemen desire.

Mirabeau B. Lamar

A BRIEF HISTORY OF THE REGULATION OF FRATERNITIES IN THE UNIVERSITY OF TEXAS

SESSION OF 1912-1913.

Facts Leading to Regulation.

On January 8, 1913, a mass meeting of non-fraternity students was held, at which the following resolution was adopted:

Whereas, We, the non-fraternity students of the University of Texas, believe that the further existence of fraternities and sororities is detrimental to the best interest of this University; and

Whereas, The question of their abolishment is to be considered in the coming session of the Legislature;

Wherefore, Be it resolved that we, in mass meeting assembled, do hereby respectfully petition that the President, Faculty, and Board of Regents of the University cooperate with us in the present movement to abolish said fraternities and sororities, and lend their aid and support to any bill to that effect which may be submitted.

At a meeting of the General Faculty on January 14, 1913, a committee of non-fraternity students made the following petition:

To the President,
Dr. S. E. Mezes,
The University of Texas.

Dear Sir:

We, the undersigned Committee, representing the non-fraternity element in the University of Texas student body, do hereby address you, the President, and, through you, the Faculty and Board of Regents of the University of Texas, as follows:

Through the course of years, the fraternity question has become a vital issue before the student body of this institution. During this time, the greater portion of the student body, known as the "barbarians," have given this matter their thoughtful and serious consideration. The expression of their opinion culminated in the resolution hereto attached. [See above.] This resolution was adopted at a mass meeting held

in the Main Auditorium of the University of Texas on Wednesday night, January the eighth, at 7:30 o'clock.

Recognizing and respecting the delegation of power to you by the Legislature of the State of Texas, enabling you to control the University of Texas, and through a dislike of inviting legislative interference in our affairs, except in the last extreme, we hereby present this resolution to you for action.

We respectfully request, as the resolution implies, that this matter receive as early and as immediate action upon your part as the difficulties of the problem may permit.

If it is your desire, we will be glad to present written and detailed arguments, or to appear before you upon your request to present oral arguments and information substantiating the position of the "barbarians."

Signed: A. G. Adair, Chairman.
J. W. Bleker, Jr.
H. L. Voorhies.
D. E. Mulcahy.
Earl H. Eddleman.
B. P. Garvey, Jr.
F. R. Stanford.

After considerable discussion, this motion was passed by the General Faculty:

Moved, That the President be requested to acknowledge the receipt of the communication, and that he inform Mr. Adair and the other members of the committee that their communication has been referred to the Faculty Council as a special committee, and that said Council, or a committee acting under the direction of the Council, will be glad to confer with the petitioners, and that at as early a date as practicable the Faculty Council will submit a report, to be passed upon by the Faculty.

At an adjourned meeting of the General Faculty on January 15, 1913, President Mezes requested that the following statement be made a part of the minutes:

Messrs. A. G. Adair,
J. W. Bleker, Jr.,
H. L. Voorhies,
D. E. Mulcahy,
Earl H. Eddleman,
B. P. Garvey, Jr.,
F. R. Stanford.

GENTLEMEN:

At a meeting of the General Faculty of the University held yesterday, your communication was presented, and it was voted that it be referred to the Faculty Council as a special committee, and that the Council be authorized to confer with you and other interested students, and to take any other steps necessary to a consideration of the question, and to report back to the Faculty its conclusions at as early a date as might prove practicable.

The Faculty Council invites you to prepare and to present to it a written statement of the reasons for the recommendation submitted by you. As soon as you advise me that the statement is ready for presentation, a meeting of the Council will be called.

Very truly yours,

S. E. MEZES.

The statement by the non-fraternity petitioners of their reasons for desiring the abolition of fraternities was filed shortly after the receipt of the foregoing letter from President Mezes. The fraternities immediately answered the objections raised in the argument of the non-fraternity petitioners; and these two documents marked the point of departure for the investigation that followed. For the documents in full, see Appendix, pp. 32-53.

Sometime in February, President Mezes, following instructions from the Faculty Council, appointed a committee to investigate the status of fraternities at the University of Texas, the committee to report back to the Faculty Council the results of its findings, together with recommendations concerning the continuance of fraternities or their abolition at the University. This committee, composed of Mr. Eby (chairman), Mrs. Kirby, Miss Casis, and Messrs. Benedict, Bantel, Hildebrand, and Parlin, held numerous conferences with students, corresponded with various institutions of higher learning, and debated for several weeks the question of the abolition of fraternities at the University of Texas. After mature deliberation, this committee formulated its report and recommendations. (See Appendix, p. 54.)

SUMMARY OF THE REPORT.

I. Introduction.

The Committee prefaced its findings by stating what it deemed two important considerations. The first of these considerations bore upon the fact that the Faculty of the University of Texas had not, up to this investigation, officially adopted any definite attitude toward fraternities; in fact, it had "scarcely recognized" them. In this connection, it was pointed out that to regulate or abolish fraternities would mean "a fairly radical change of policy." The second consideration had to do with student self-government. Fraternities were entirely a student enterprise, and it might seem that any question of their status in the University was a matter to be settled by the student body rather than by the Faculty. The Committee, however, concluded that the fraternity question was "too complex for solution by the student body alone."

II. Body.

In view of the foregoing considerations, the Committee stated its findings, which consisted of points for and against fraternities, the rights of fraternities, improper activities of fraternities, etc. Two things stood out in the protest made by students against the fraternities, the social exclusiveness of these clubs and their political activity. After careful consideration of the foregoing facts, the Committee recommended that fraternities "be not immediately abolished, but be subjected to the regulations immediately following:

"1. Before students can be initiated into fraternities, sororities, or like organizations, they must have passed in one long session at least four courses of regular work counting for degrees, or four and two-thirds courses in one long session and the subsequent Summer School. Students coming from other colleges shall be subject to this rule, except that those credited here with at least four courses toward a degree for work done during their last year of attendance at the institution from which they came may be initiated on the completion of twelve hours of work during the first term of attendance here. If, however, they fail to complete twelve hours of work during the first term of attendance here, they must comply with the first provision of this regulation.

"2. Members of fraternities, sororities, or like organizations may not board or lodge in chapter houses, or like club houses, unless they have passed at least twelve hours of class work in the preceding term; and members boarding or lodging in chapter houses, or like club houses, who at mid-term reports are found to be doing passing class work in less than twelve hours of class work, or who at the end of a term fail to pass in at least twelve hours of class work, shall cease to board or room in the chapter house, or like club houses, and may not return until they complete at least twelve hours of class work in a subsequent term.

"3. No student who is not a regular member of the fraternity, sorority, or like organization may room or board in the chapter house.

"4. Pledging for any academic year shall not take place before September 15.

"5. Each sorority must have a suitable chaperon, subject to the approval of the Dean of Women.

"6. In every chapter house, or club house, there shall be a resident member who shall have received the approval of th Faculty Committee on Student Social Organizations. This member may be a senior student, a graduate student, or other person approved by the Committee, and shall be responsible to the Committee of the Faculty for the carrying out of these regulations and reforms.

"7. There shall be appointed a standing committee of the Faculty on Student Social Organizations, whose duty it shall be to attend to the enforcement of these regulations."

III. Conclusion.

In concluding its report, the Committee pointed out that it would be unfair to abolish the fraternities without warning and before any opportunity to reform had been offered. The abolition of fraternities, it seemed to the Committee, would not wholly eradicate social exclusiveness and unfair political activity. It was hoped by the Committee that improving the scholarship of the fraternities would enable the more intelligent and maturer members of these societies to predominate, and thus lead to more natural and democratic activities in fraternity and University life. The following matter should be stressed as the final statement of the Committee's report: "It is incumbent upon them [the fraternities] to make the one-year rule effective, to erase pernicious political activities, and to eliminate their snobbishness. . . . Justice and fair play demand that active op-

position to the fraternities should cease so that they may have every opportunity to correct the abuses which they have fostered. . . . If at the end of this period of probation [two years], impartial investigation should find that the system is still a source of serious grievance, it is our united and emphatic recommendation that more drastic action than is now proposed shall be taken."

This report of the Committee of the Faculty Council was duly presented to the Council, and recommended by that body to the General Faculty at a meeting held April 22, 1913. The General Faculty received the report as outlined above, adopted the regulations therein prescribed, and voted that these regulations go into effect June 10, 1913.

Shortly after the adoption of the regulations governing fraternities and like social organizations, President Mezes appointed a committee of the Faculty to put the regulations into effect. This Committee had hardly assumed its duties when it was petitioned by the men's Pan-Hellenic Council, representing the fraternities of the University, to change the rules in the following respects: (1) "that fraternities be allowed to pledge eligible freshmen on the third Wednesday of May of each year, provided that any bid shall lapse in the case of a pledge failing to make the required four courses in the spring term"; (2) "that the scholarship rules regarding those boarding in fraternity houses be removed, retaining the rule only as to roomers therein." The sororities concurred in this petition, and both the women's and the men's Pan-Hellenic Councils drafted rules governing rushing and pledging which were intended "to prevent a recurrence of the undesirable features heretofore connected with rushing." The Faculty Committee after careful consideration declined to entertain the second proposal of the men's Pan-Hellenic Council, but did recommend to the General Faculty the first proposal in the following form:

"For section 4 of the proposed regulations, reading: 'Pledging for any academic year shall not take place before September 15,' that the following be substituted: 'Eligible freshmen may be pledged on or after the third Wednesday in May, provided (1) that any invitation shall lapse in case the pledge fails to make the required four courses in the spring term; (2) that there shall be no rushing of freshmen whatever

in the fall term, and that such rules as the Pan-Hellenic Councils make for governing the rushing during the winter and spring terms shall meet with the approval of the Committee on Fraternities and Sororities.' ''

The General Faculty immediately referred the matter to the Faculty Council. The latter body met on May 28, 1913, and, after a careful consideration, adopted the following rule to replace Section 4 of the regulations as originally passed by the Faculty:

''First-year students may be pledged on or after the third Wednesday in May of each year. An invitation may not be extended to a first-year student unless he has passed in four courses for the preceding fall and winter terms. In case a first-year student, so pledged, shall fail to make the required four courses by the end of the spring term, the pledge shall lapse. Students pledged in the spring conditionally upon passing four courses at the spring examinations may not be initiated until they have registered in a subsequent term of a long session.''

In view of this change in the regulations, the fraternities and sororities formulated a number of rules governing rushing, the chief aim of which was to prohibit all rushing during the fall term, and to reduce the expense and frequency of rushing parties after the rushing season began in the winter term. (See Appendix, p. 62.)

SESSION OF 1913-1914.

First Year of Regulation.

The rules governing fraternities first became effective in the session of 1913-1914. As the situation that developed in the enforcement of the regulations was, during this first year, a complicated one, certain points should be borne in mind. The regulations aimed to do two things: (1) to maintain a normal scholarship standing in the fraternities by excluding from the chapter houses all members who might be failing to pass in twelve hours of work; (2) to establish a closed season during the freshman year, thereby enforcing sophomore initiation into the fraternities.

The history of the regulations as they affected fraternities through the operation of the "house rule" may be summarized as follows for the session of 1913-1914:

During the fall term of this session the rule that forced fraternity members to leave the chapter houses for reasons of poor scholarship operated, to all intents and purposes, in a satisfactory way. The financial pressure upon the management of the chapter houses was not great during the fall; and the regulations as a whole, being new and somewhat uncertain as yet in their severity, were undoubtedly generally obeyed. In the winter term the rushing began, the financial distress became greater, and the various groups grew more apprehensive in the face of depleted chapter rolls and the prolonged rushing season. It was in the winter term that rumors of violations of the pledging rule, and what were undoubtedly violations, became generally known in the student body. The Committee in charge of the regulations was aware of what was happening; but, unable to get hold of more than rumor, rested on its confidence in the senior representatives of the fraternities.

On May 26, however, the chairman of the Committee in conversation with a prominent fraternity man was at first jokingly, but later seriously and reliably, informed of a violation of the house rule; that is, he was told that a man who was supposed to have moved out of the chapter house on account of poor scholarship had only made a pretense of doing so. The chairman verified the facts in the case, and immediately reported the matter to the Discipline Committee of the General Faculty. The Committee in charge of the regulation of the fraternities then investigated the situation as a whole by taking the lists of men and women who were reported by the senior representatives to have moved from the chapter houses for reasons of low scholarship, and verifying each case for the entire session. The result was that the sororities were found to have obeyed the rule absolutely, while eight out of the sixteen fraternities were suspected of falsifying reports of the suspension from the chapter houses of men who were passing in less than the required twelve hours of work. The facts in the case were transmitted to the Discipline Com-

mittee at once. The matter was gone into at great length, and a report of the findings was made by Judge Townes to the President of the University.

This report gives an excellent analysis of the whole situation, and further details as to the situation from January to June, 1914, can be found in this document. (See Appendix, p. 65.) The eight chapters reported to the Discipline Committee were found guilty, in varying degrees, and fourteen individuals in the eight chapters were found to have violated, through misunderstanding, carelessness, or with full knowledge of the situation, the rule requiring fraternity members to cease rooming and boarding in the chapter houses when such members were passing in less than twelve hours of work. Various suggestions were made in the report for the punishment of the offending parties.

Judge Townes' report is dated June 4, 1914. Commencement was at hand; President Mezes was on the eve of departure for Europe; he returned to the University after the opening of the 1914-1915 session in the fall, and shortly afterwards resigned. These circumstances may explain why none of the fraternities that had violated the house rule was punished. The general shake-up during the investigation of the situation, however, was not without its effects upon the local chapters as well as upon the national officers of the fraternities.

The history of the regulations as they aimed to establish sophomore initiation, by requiring that all first-year students pass in four courses before they were eligible to be pledged or initiated by fraternities, may be summarized as follows:

During the session of 1913-1914, fraternities and sororities were not permitted to initiate first-year men, thus depleting their membership considerably and increasing the financial burden of the chapter houses. The "house rule," which made members of fraternties ineligible to live in the chapter house if passing in less than twelve hourse at mid-term and at the end of the term, still further strained the finances of the various chapters. By common consent the fraternities had agreed not to rush until after the opening of the winter term. When the rushing began in January, it developed that there were about one hundred freshmen who formed a group the individuals of

which were hotly contested for by the different chapters. The strong competition for members, intensified by the apprehension of depleted chapter rolls, and complicated by the peculiarities of what is known as rushing, gave rise to a very serious situation.

A small group of freshmen were being constantly entertained from January to May. This constant entertainment, necessitated in the minds of fraternities by the close contest for members, exalted the freshmen unduly, interferred with their University work, and became itself an unmitigated nuisance to the members of the social clubs. Quite naturally, as the contest continued, mutual suspicions grew up. Rumors of violation of the rushing rules grew into certainties in the minds of the rival groups. It became increasingly difficult to distinguish between rushing and tacit pledging; and finally by degrees the rushing rules of the fraternities collapsed. In the situation that had developed by the date officially set for pledging, mutual distrust as to the good faith of the participants in the rushing had grown to such proportions that many of the chapters had violated the spirit, if not the letter, of the Faculty regulation governing pledging.

Rushing and pledging are closely related, and upon consideration of the facts, it is now clear that any pledging rule was bound to fail with the uncertainty incident to the intricacies of rushing and the confusion and bad feeling aroused by unscrupulous people both in the University and outside of it. An instance of the difficulty of telling where rushing left off and pledging began was brought concretely to the Committee's attention by a complaint, lodged against one sorority by another, of a violation of the Faculty rule concerning pledging. Late in the spring complaint was made by the Kappa Alpha Theta sorority that the Pi Beta Phis had been guilty of a violation of the pledging rule. The Committee made an investigation of the case, with the result that it was impossible to discover the truth or falsity of the complaint. The opposing parties to the case contradicted one another, and there was simply the word of one girl against that of another. Furthermore, the case was complicated by the fact that persons other than students of the

University were concerned. The case was undoubtedly typical of much that was happening at the time, and was sufficient to convince the Committee that it would be futile, if not dangerous, to try cases involving violations of the pledging rule. (See Appendix, p. 72.)

The difficulty of determining with fairness and certainty such violations of the pledging rule, together with the general confusion that had developed in the months from January to May, 1914, convinced the Faculty Committee in charge of the regulations that the closed season was impractical. To guard against a hasty jumping at conclusions, however, the Committee decided to inquire of other universities what had been their success with sophomore pledging. The University of Wisconsin had undergone an experience with fraternities similar to that of the University of Texas, and was at this time experimenting with sophomore pledging. In response to inquiries of the Committee, Professor F. W. Roe, in charge of the regulation of fraternities at Wisconsin, replied in a letter dated May 22, 1914, as follows:

"We have just completed a two-weeks' rushing period, and the general opinion among those who know is that it has been most unsatisfactory. The present Faculty rule requires that there should be no rushing and pledging of freshmen until the first day of May. The fraternities and sororities agreed to a short rushing period following May 1st,—about two weeks for the fraternities and one week for sororities. These conditions presuppose that there had been no rushing and pledging of freshmen prior to May 1st, and the effort of the Student Interests Committee has been to maintain this situation. I am personally fully convinced that it is impossible for the Faculty to effectively enforce any such rushing rule. In my opinion we should allow rushing and pledging at the beginning of the freshman year for the following reasons:

"1. Because it is impossible to keep thirty-three competitive groups from doing a certain amount of rushing all through the non-rushing period;

"2. Because a late rushing period arbitrarily and artificially separates freshmen from upperclassmen under conditions about the campus which are detrimental to the harmony and unity of undergraduate life;

"3. Because any late rushing period necessarily overstimulates a large group of students, and distracts their attention

from their studies so that generally members of the Faculty feel that they get no satisfactory work from the students during the period;

"4. Because a late rushing period seems to enable the strongest fraternities and sororities to dominate the situation as against some that are newer and less strong, but equally entitled to a place in our community, and equally to be benefitted by getting in good material."

On June 1, 1914, the chairman of the Commitee on Student Social Organizations at the University of Texas replied to Professor Roe as follows:

"I wish to thank you for your letter of May 22. We have attempted to regulate fraternities here, as the enclosed copy of our rules will show. You will note that we say nothing of rushing. This we left to the fraternities. The Pan-Hellenic Councils of the fraternities and sororities have attempted to regulate rushing and have failed utterly. Our Faculty rule governing pledging was violated by all sorts of evasions, and I heartily agree with you that any Faculty supervision of rushing or pledging is out of the question. The situation involves too many individuals both in and out of the University, and any adequate hold on such a complex social activity is quite out of the reach of the Faculty, or any one else for that matter. I believe as you do that rushing and pledging at the beginning of the freshman year is less objectionable, for it is more expeditious, and settles matters which if prolonged lead to dangerous rivalry and all sorts of bitter personalities.

"We are thinking seriously of doing away with all supervision except that of enforcing a scholarship rule. You will note that we have a scholarship requirement governing residence in the chapter house. This is open to the objection that it assesses a financial penalty on the chapter for the dereliction of individuals, and accomplishes little. Personally I believe that a rule requiring a certain scholarship standing on the part of both the freshman and the fraternity as a group before initiation can take place, would be consistent and effective. This is what we are working toward here at Texas."

On June 5 Professor Roe replied as follows: "I am interested in your opinion on rushing. Your experience is exactly what ours has been, and I agree entirely with the views set forth in your letter. At its regular monthly meeting on June first the Faculty passed a resolution, which I introduced, allowing rushing and pledging of freshmen immediately after registration. If the fraternities and sororities wish to adopt further

rules to the effect that rushing is not to begin for a week or so after registration, they are at liberty to do so. But the Faculty, in accordance with this action, will make no effort to control the uncontrollable. I should not agree with Rule 4 in your regulations postponing pledging until May. I should think that you would have a considerable amount of difficulty in enforcing such a rule, at least that has been our experience at Wisconsin. The less scrupulous are almost sure to adopt some means of establishing an agreement between themselves and freshmen."

It will be noted from the foregoing correspondence that the University of Wisconsin and the University of Texas were working along similar lines in the regulation of fraternities. In the same scholastic year, 1913-1914, both universities were attempting to regulate pledging in an effort to enforce sophomore initiation of fraternity members. At both institutions the conditions were identical, and the conclusions of those in charge of the regulation of fraternities at both universities were the same. The Faculty of the University of Wisconsin abandoned the attempt to regulate the rushing and pledging of freshmen by fraternities June 1, 1914, as is stated in Professor Roe's letter quoted above.

SESSION OF 1914-1915.

Second Year of Regulation.

The difficulty of determining with fairness and certainty violations of the pledging rule, together with the general confusion that had developed in the months from January to May, 1914, convinced the Committee in charge of the regulations that the closed season was impractical.

Therefore, in September, 1914, the following recommendations, with the reasons therefor, were submitted to the General Faculty:

"The Committee of the Faculty on Fraternities and Sororities [the Committee on Student Social Organizations] respectfully urges the following changes in the Faculty regulations governing such organizations:

"I. That not later than September, 1915, section 2, commonly known as the 'house rule,' be stricken out, and the following 'group rule' be inserted in its place: 'No chapter of a fraternity, sorority, or like social organization, shall initiate any person to its membership, unless the average scholarship of such chapter both as to amount of work passed and grade made shall be slightly above the average of the University, excluding courses officially listed as open to freshmen. Chapter validity in this matter of initiation shall be established during one long session, and hold good for the following year. Chapter invalidity may be removed by the fall term's work, the establishment of such validity not to be claimed before February fifteenth.'

"II. That section 4 of the regulations be abolished for the following reasons:

A. The regulation is difficult of enforcement:

1. If a date for pledging is set and rushing is not prohibited, it is practically impossible to tell when rushing leaves off and pledging takes place.

2. Under the stress of rushing, violations are apt to become so general as to make it impossible for the Committee to raise cases against individual chapters.

3. The Committee is bound to become more and more the court of arbitration for the settlement of petty disputes between chapters over pledges, a situation that would involve the Committee in serious difficulties, impossible of satisfactory solution.

4. Cases of violation involve so many individuals both in and out of the University and touch upon so many personal relations, that it is well nigh impossible to arrive at evidence and conclusive judgment.

5. The enforcement of the rule presupposes a vigilance and closeness to the student body which it is impossible for a faculty committee to maintain.

B. The regulation has worked out in an undesirable way among the students in that:

1. It has segregated a small group of freshmen from the student body for rushing purposes.

2. Such a group has been made conspicuous for months, and greatly set up in its own estimation by this prominence.

3. The studies and normal life of this group of freshmen have been seriously interfered with by constant rushing.

4. The fraternity question has been kept constantly in the air, and the system made almost intolerable for the members themselves:"

The Faculty adopted the recommendations of the Committee on Student Social Organizations. Two important changes were thus effected:

1. The closed season for pledging was abolished.

2. The house rule requiring that the members of fraternities should be passing in twelve hours of work to be eligible to live in the chapter house was replaced by a more logical rule requiring the chapter to maintain an average scholarship equal to that of the University to be eligible to initiate eligible pledges. The "house rule" was to remain in operation, however, during the session of 1914-1915.

The effects of this change on the regulations governing social groups in the University were that, in the fall of 1914, the pledging of freshmen took place at the opening of the session, rather than in May, as in the session of 1913-1914. The house rule remained in effect throughout the session of 1914-1915 as during the session of 1913-1914. The Committee was unable to detect any violations of this rule during the session of 1914-1915. During this session, the various fraternities were establishing the scholarship averages that were to determine their eligibility to initiate in the fall of 1915.

In the summer of 1915, the Committee on Social Organizations collected statistics in regard to the scholarship standing of the fraternities; this in pursuance of the rule requiring the fraternities to make at least the average of the University in order to be eligible to initiate.

The following figures represent the scholarship averages of the University as a whole and the various fraternities and social organizations of the University during the session of 1914-1915. The University average was computed on the work of all students who were present in the long session of 1914-1915 and who had up to this session passed in as much as four courses counting towards a degree. The averages of the individual clubs were computed upon the rolls of the chapters, as officially listed with the Faculty Committee. To allow for quality

(grades) in work, the actual number of courses passed was increased by reducing all work to a common grade of D. For this purpose, D=65, C=75, B=85, A=95. (See Appendix, p. 82.) All chapters below the University average (5.78 courses) were ineligible to initiate pledges, except in the cases of Alpha Delta Pi and the Phi Kappa Psi, where, in view of the conditions of the count, the Committee felt the slight deficiency hardly warranted the refusal of permission to initiate. These two chapters were therefore declared eligible to initiate their eligible pledges.

Beta Theta Pi	6.74
Sigma Alpha Epsilon	6.48
Phi Delta Theta	6.35
Delta Tau Delta	6.35
Sigma Chi	6.23
Sigma Nu	6.15
Delta Delta Delta	6.05
Delta Chi	6.04
Delta Kappa Epsilon	5.99
Chi Omega	5.96
Pi Beta Phi	5.87
Zeta Tau Alpha	5.84
University Average	5.78
Alpha Delta Pi	5.75
Phi Kappa Psi	5.72
Kappa Alpha Theta	5.59
Phi Mu	5.52
Theta Xi	5.37
Phi Gamma Delta	5.19
Kappa Sigma	5.14
Alpha Tau Omega	5.10
Kappa Kappa Gamma	5.08
Delta Sigma Phi	5.05
Kappa Alpha	5.05
Chi Phi	5.00

On April 13, 1915, a petition was presented to the General Faculty by about fifty students again requesting the abolition of fraternities at the University of Texas. (See Appendix, p. 75.)

Dean Sutton offered the following resolution:

"Whereas, at the meeting of the Faculty held in April, 1913, it was decided that the regulations concerning fraternities and

sororities that day adopted should be given a fair trial for two years, and that, if, at the end of the probationary period, impartial investigation should disclose the fraternity system to be a source of serious grievance, more drastic action should then be taken: be it

"Resolved, That the President appoint a committee of the Faculty to investigate impartially the results of the enforcement of the regulations concerning fraternities and sororities adopted two years ago, and to make a report of its findings to the Faculty at a date as early as practicable."

President Battle was directed to inform the petitioners of the action of the Faculty. Later Dr. Battle referred the petition to the Committee that had originally investigated the status of fraternities at the University of Texas. This committee was composed of Mr. Eby (chairman), Mrs. Kirby, Miss Casis, Messrs. Benedict, Bantel, Hildebrand, and Parlin. (For the report of this committee, see below, p. 26.)

SESSION OF 1915-1916.

Third Year of Regulation.

At the opening of the University in September, 1915, ten fraternities were unable to initiate because of poor scholarship. It should be borne in mind that the fraternities did not know what the average of the University would be during the session of 1914-1915. And it was impossible for the Committee on Social Organizations to give out very accurately what the conditions of the statistical count would be, for only an actual counting of the grades could possibly disclose the difficulties in drawing the average of the University and the averages of the various fraternities. As soon as the ten fraternities affected learned of their ineligibility, they sought conferences with the Committee, and all points at issue were considered. It so happened in the case of every fraternity ineligible to initiate that all contested points in the counting of the averages of these chapters could have been waived in favor of the fraternities involved without establishing the eligibility of a single chapter.

This was very fortunate for the Committee; and the scholarship statistics published above are exactly as they stood in the original count made by the Committee. The fraternities declared ineligible to initiate in September, 1915, accepted the situation in the best possible spirit, and set to work to improve their scholarship during the fall term.

In January, 1916, the Committee, in accordance with the following instructions in the regulations—

"Chapter invalidity [in the matter of initiation] may be removed by the fall term's work,"—

drew the scholarship averages for the fall term of the ten chapters delinquent at the opening of the session. The following results were obtained, the first nine chapters in the list being declared eligible to initiate:

Delta Sigma Phi	6.95
Kappa Sigma	6.91
Kappa Kappa Gamma	6.45
Alpha Tau Omega	6.30
Kappa Alpha	6.19
Chi Phi	5.84
Theta Xi	5.83
Phi Gamma Delta	5.78
University Average	5.78
Kappa Alpha Theta	5.76
Phi Mu	5.00

It will be noted in the foregoing scholarship lists that the highest scholarship average made by any chapter during the session of 1914-1915 was 6.74 courses. Two of the chapters declared ineligible to initiate because of poor scholarship in September, 1915, in January, 1916, had made during the preceding fall term a standing of 6.95 and 6.91 respectively, a marked advance over the highest average for the session of 1914-1915.

One of the real difficulties that the fraternities met in their attempts to reach the University average during the session of 1914-1915 was the inability of the Committee to state definitely the conditions under which the count would be made. In the fall of 1915, the Committee was prepared to consider more scientifically the various factors in the study of the scholarship statistics. After a careful consideration, a list of conditions were

decided upon for the scholarship count of 1915-1916. These conditions were considered only tentative. (See Appendix, p. 81.)

SCHOLARSHIP AVERAGES FOR 1915-1916.

Delta Kappa Epilson	7.21
Delta Sigma Phi	7.18
Delta Chi	6.97
Phi Delta Theta	6.89
Beta Theta Pi	6.76
Kappa Sigma	6.67
Alpha Tau Omega	6.62
Kappa Kappa Gamma	6.41
Pi Beta Phi	6.40
Acacia	6.40
Phi Kappa Psi	6.30
Sigma Alpha Epsilon	6.29
Sigma Chi	6.28
Zeta Tau Alpha	6.26
Delta Tau Delta	6.26
Alpha Delta Pi	6.24
Kappa Alpha	6.19
Delta Delta Delta	6.15
Theta Xi	6.11
Phi Mu	6.11
University Average	6.11
Chi Omega	6.01
Phi Gamma Delta	5.90
Chi Phi	5.88
Kappa Alpha Theta	5.86
Sigma Nu	5.67

ACADEMIC.

Upper Classes.

Men	5.64
Women	5.98
Men and Women	5.82

Freshmen.

Men	4.53
Women	5.15
Men and Women	4.82

LAW.

Average	6.83

ENGINEERING.

Average. 5.63

ACADEMIC.

Average. 5.82

UNIVERSITY.

Average. 6.11

SESSION OF 1916-1917.

FOURTH YEAR OF REGULATION.

The fall term of 1916-1917 was uneventful as far as the regulation of the fraternities was concerned. The scholarship rule had been in effect two years; the conditions under which the averages were computed had become more or less fixed and generally known; and the Committee consequently found no serious trouble in administering the regulations. At the opening of the session, four fraternities had been declared ineligible to initiate. By provision of the regulations "chapter invalidity may be removed by the fall term's work." The following averages were made in the fall term by the chapters ineligible to initiate in September:

Kappa Alpha Theta. 7.13
Phi Gamma Delta. 6.90
Chi Omega. 6.39
University average. 6.11
Chi Phi. 6.07
Sigma Nu. 5.64

The first four fraternities were declared eligible to initiate by the Faculty Committee. In the judgment of the Committee, the the closeness of the Chi Phis to the required average, together with extenuating circumstances in the computing of their average, made it only just to allow this fraternity to initiate.

Early in February, 1917, the chairman of the Committee in charge of the regulation of fraternities was informed by the senior representative of the Phi Gamma Delta fraternity that a student ineligible for initiation at the University of Texas had,

during the preceding Christmas holidays, been initiated into this fraternity at the University of Kansas. The chairman immediately took the matter up with the student concerned, and later reported the case to the Discipline Committee as a violation of the rules. The Discipline Committee took cognizance of the facts and called the student and fraternity concerned to account. In the course of the hearing an alumnus of the University, who was also a fraternity man, alleged that initiations such as the one under consideration had taken place in several instances, ineligible pledges, for example, going to Georgetown and there being initiated by Southwestern chapters. The chairman of the Committee in charge of the regulations put the facts before the fraternities. Several chapters officially repudiated this charge. The matter was quietly but thoroughly gone into by the Committee on Social Organizations; and no other instance than that originally brought to light could be found of the initiation, by chapters at the other institutions, of Texas students ineligible for initiation at the University of Texas. It developed during the present trial, however, that the Phi Gamma Delta fraternity had been guilty the session before of a violation similar to that immediately under consideration by the Discipline Committee.

On March 3, 1917, the chairman of the Committee on Social Organizations was notified by the Secretary to the President of the suspension for the remainder of the session of two students of the University of Texas: the student initiated into Phi Gamma Delta at Lawrence, Kansas, during the Christmas holidays, 1916; and the corresponding secretary of the Texas chapter of Phi Gamma Delta. The Discipline Committee in recommending the foregoing penalties had held "the local chapter of Phi Gamma Delta blameless in regard to this initiation." Later, upon the introduction of new facts, the Discipline Committee recommended that the penalties noted above be mitigated, and the students so penalized were reinstated in the University respectively on April 11 and April 2, 1917. The original report of the Discipline Committee to the President of the University is given in the Appendix, p. 73; and the full history of the case may be found in the files of the Discipline Committee. The names of the students involved have been withheld out of con-

sideration for the memory of one of them who has since died in the service of his country.

Toward the end of April, 1917, the student body was seriously affected by the military situation that followed the declaration of war on April 6. At the end of April, men students began withdrawing from the University in increasing numbers. With the announcement of the first Reserve Officers' Training Camp, a very large number of male students withdrew almost simultaneously. The fraternities were immediately and seriously affected by this withdrawal of men, as is noted in the table of statistics given below. The following petition was filed by representatives of the fraternities with the Committee on Social Organizations about May first:

"All fraternities of the University of Texas through their regularly appointed delegates hereby petition the Faculty to allow each fraternity to initiate all pledges who may be eligible for initiation, their eligibility to be reckoned from the grades of such pledges for the fall and winter terms. In view of the present crisis, we believe that the Faculty will see that the future existence of fraternities here at the University depends upon this liberal policy.

"We further request that for the scholastic year 1917-1918, or so long as the war crisis may last, the Faculty rules concerning the initiation of pledges be temporarily abrogated. We further plead for immediate action.

Signed: Ernest Thompson,
R. K. Hanger,
R. H. Walker, Jr.,
Committee."

The Committee, desirous of meeting what seemed an urgent crisis, decided to recommend immediately the first point of this petition, in the meantime taking the second point under consideration for more careful study. On May 3, 1917, the Executive Council of the Faculty passed the following resolution upon the recommendation of the Committee:

"Resolved, That all men's fraternities be allowed to initiate eligible pledges at once, eligibility to be determined by the work of the fall and winter terms. In making this special dispensation, it is understood that no boarding house contracts shall be broken by men initiated under the foregoing provision."

Below are given in tabular form the statistics gathered by the Committee, upon which the Committee later recommended to the General Faculty the suspension for the session of 1917-1918 of the rule governing the initiation of men into the fraternities.

Fraternities 1916-1917	Fall and Winter	Spring Initiation	Total	Entered Military Service	Returned, Fall of 1917
Acacia	19	3	22	16	5
Alpha Tau Omega	15	5	20	13	8
Beta Theta Pi	18	5	23	9	10
Chi Phi	12	11	23	9	7
Delta Chi	21	9	30	9	10
Delta Kappa Epsilon	20	6	26	12	8
Delta Sigma Phi	14	4	18	12	11
Delta Tau Delta	26	6	32	15	11
Delta Theta Phi	23	8	31	12	6
Kappa Alpha	22	1	23	13	5
Kappa Sigma	16	5	21	10	7
Lambda Chi Alpha	10		10	6	5
Phi Delta Theta	30	3	33	14	12
Phi Gamma Delta	19	12	31	13	18
Phi Kappa Psi	21	4	25	8	11
Sigma Alpha Epsilon	28	3	31	18	11
Sigma Chi	17	4	21	8	8
Sigma Nu	10	12	22	9	5
Theta Xi	16	8	24	10	10

On May 8, 1917, the General Faculty passed the following provision:

"If by September 15, 1917, the students who have entered the Officers' Training Camp are not released, or if conscription and other military exactments are in force, the Committee on Social Organizations is authorized to suspend for one year the rules governing the initiation into fraternities of first-year men."

In the spring of 1915, a group of non-fraternity students petitioned the General Faculty for the abolition of fraternities. This petition was in pursuance of a recommendation in the report of the original investigating Committee that the regulations governing fraternities be tried out for two years. The General Faculty on April 13, 1915, adopted a resolution calling for a committee "to investigate impartially the results of the enforcements of the regulations concerning fraternities and sororities adopted two years ago." President Battle referred the matter to the original investigating Committee, and on January 8, 1917, this Committee formulated the following report:

To the General Faculty:

"We, your Committee on the investigation of the fraternity situation, respectfully submit the following report:

"During the session of 1915-1916, the Committee held a number of meetings, discussed the local conditions, the operation of the system of regulations in effect the past three years, and the present conditions in other institutions. It is our conviction that there is no new development that makes it necessary to change at this time. We therefore unanimously recommend that the system of regulations under which fraternities and sororities now operate at the University be continued."

Sometime in the late spring of 1917, the foregoing report was presented at a meeting of the General Faculty by Dean Benedict and adopted.

Below will be found the official statement of the scholarship standing of the various fraternities for the session of 1916-1917. The method of computing the averages that has prevailed in the past was followed, with these exceptions, that only the work of the fall and winter terms was counted in the chapter averages, and that no new calculation of the general University average was made. The Committee's reason for varying at all from the practice of former years was that the spring term records were greatly complicated: (1) by the adding of military courses with a consequent confusion in grades, and (2) by the withdrawal of students going to military camps, with credit for work in some cases and not in others. The spring term did not seem a normal term in other respects, and the Committee therefore felt justified in basing their calculations on the work only of the fall and winter terms in the case of the chapter averages, and in retaining the average of 6.11 as the general standard of the University for 1916-1917.

Fraternity Averages.

Phi Delta Theta	7.26
Alpha Tau Omega	7.16
Delta Chi	7.03
Beta Theta Pi	6.95
Delta Kappa Epsilon	6.87
Kappa Alpha	6.50
Acacia	6.47
Sigma Alpha Epsilon	6.47
Sigma Chi	6.37

Delta Tau Delta. 6.21
Chi Phi. 6.15
University average. 6.11
Phi Gamma Delta. 6.01
Delta Theta Phi. 5.94
Phi Kappa Psi. 5.84
Sigma Nu. 5.78
Kappa Sigma. 5.68
Delta Signa Phi. 5.64
Theta Xi. 5.56
Lambda Chi Alpha. 5.55

Sorority Averages.

Kappa Alpha Theta. 7.11
Kappa Kappa Gamma. 6.91
Chi Omega. 6.62
Phi Mu. 6.27
Pi Beta Phi. 6.21
Zeta Tau Alpha. 6.11
University average. 6.11
Delta Delta Delta. 5.98
Alpha Delta Pi. 5.90

SESSION OF 1917-1918.

Fifth Year of Regulation.

The number of fraternity men who returned to the University in September for the session 1917-1918 averaged, as the figures given in the table above show, about eight or nine to the chapter. It will be borne in mind that the fraternities had been allowed to initiate eligible pledges in the spring of 1917, and hence were practically without sophomore recruits for the ensuing session. To be concrete, they had lost by withdrawal for military service in May, 1917, what amounted to more than the regular yearly addition to their membership. It was clearly impracticable for the fraternities to operate their chapter houses with a membership of eight or nine men. There were only two ways out of the situation: either the fraternities must abandon any preference as to choice of members and replenish their ranks from eligible upper classmen, or the Committee must exercise the authority granted it by the Faculty and suspend the rule governing the initiation of first-year men, thus permitting a selection

of members from the entering freshman class. The latter way seemed undoubtedly the intention of the Faculty under the conditions; and therefore the Committee notified the fraternities on September 25, 1917, that the Faculty rule governing the initiation of first-year men had been suspended for the session of 1917-1918. The fraternities and sororities were also informed that all scholarship records would be kept as usual, and that the sororities were to be held to the full requirements of the regulations.

It will be noted in the scholarship records for 1916-1917 that two sororities had failed to make the average required to make these chapters eligible to initiate. As the averages had been computed upon the work of the fall and winter terms, the Committee felt obliged to grant the claim of these chapters to a count of the spring term's work in determining finally their eligibility to initiate. In only one case, that of the Delta Delta Delta sorority, was the average raised sufficiently by counting all three terms to permit initiation by the chapter delinquent upon a basis of two terms. The average of the Delta Delta Delta sorority, by counting the three terms, was 6.24, and the chapter was declared eligible to initiate in October, 1917. The Alpha Delta Pi sorority was unable to initiate until after January 3, 1918, when, in accordance with the regulations, this chapter was declared eligible, having made in the fall term an average of 6.29.

The fraternities continued to operate during this session as usual, except that the men's chapters were allowed to initiate without restriction. The sororities were able to maintain their membership at its normal number, and in all instances submitted to the regulations without complaint and without asking for any suspensions of the rules in their favor. The membership of the men's clubs was seriously affected by war conditions. The chapters were composed largely of underclassmen, and the chapter life reflected the lack of mature leadership among the men that characterized the male student body generally. The chapters averaged about fifteen members, with an average of eleven living in the chapter houses. During the session, the various groups among the men lost by withdrawals for military service an average of five to the chapter. The chapters were

thus robbed throughout the year of their members, especially of their older members.

At a meeting held May 14, the General Faculty passed favorably upon the following request:

"In view of the unsettled conditions of student life at the University due to the war, and especially in view of the probable decrease in attendance of men at this institution next fall, the Committee on Student Social Organizations requests that it be granted by the Faculty the authority to suspend for one year, beginning September 15, 1918, the rule governing the initiation of men into fraternities."

CONCLUSION.

The Committee that investigated the fraternities at the University of Texas came to the conclusion that many of the abuses complained of in the fraternity system were due to the immaturity of the members of fraternities. To raise the average intelligence of these social organizations seemed the most obvious and practicable method of correcting their abuses. The chief aim, therefore, of the regulations recommended by the investigating Committee was to improve the scholarship of the fraternities. This the regulations attempted to do in two ways: by requiring a student to pass in one long session four courses counting toward a degree to be eligible for initiation; and by requiring the fraternities as groups to maintain an average scholarship equal to that of the University as a whole to be eligible to initiate eligible pledges.

While the regulations were changed in two important particulars during the first three years of their operation, the original principle that underlay them remained unimpaired. The abandonment of the so-called "closed season," or sophomore pledging, can only be explained by the frank admission that, under the existing plan of competition by the fraternities for members, rushing and pledging could not be effectively controlled by the Faculty. But in giving up sophomore pledging, the regulation of fraternity scholarship was not affected. While the freshman could be pledged when he entered the University, he

could not live in the chapter house nor was he eligible for initiation until he had passed in one long session four full courses. In abolishing the rule requiring that a student be passing in twelve hours of work to live in the chapter house, the Faculty merely got rid of a cumbersome piece of machinery, and immediately replaced it by what has proved to be the most workable and effective single item in the regulations. The rule requiring the various fraternity groups to make in one long session a scholarship average equal to that of the University in order to be eligible to initiate eligible pledges, has done more to redeem the academic standing of the fraternities than any other thing. The evolution of the present plan of scholarship supervision has been clearly and deliberately in the direction of a practicable and consistent regulation. No other institution of the rank and character of the University of Texas requires a longer probation of the freshman preliminary to entering a fraternity; and no similar institution makes any requirement of the individual chapters for eligibility to initiate. The University of Texas may be said to have the most consistent and drastic regulation of fraternities of all state universities.

In submitting to the regulations, the women may be said to have behaved better than the men. In no instance since the regulations went into effect have the sororities been guilty of a direct violation of the rules. The débâcle in the spring of 1914, while due in part to the difficulties inherent in the situation, was also due in part to the failure of some of the men's clubs to abide scrupulously by the rules. The Faculty admonition that the fraternities "make the one-year rule effective" can hardly be said to have been obeyed. Whatever explanation or extenuation is to be made of this failure of the fraternities can be found in Judge Townes' report to President Mezes on the violations of the "house-rule." (See Appendix, p. 65.) Since 1914, the violations of the Faculty regulations governing fraternities have been so few and singular as to be negligible. In any judgment of the fraternities as responsible student groups, it would be unfair to pass over another admonition of the Faculty to the student body. In the report recommending regulation adopted by the Faculty in May, 1913, there occurs the fol-

lowing passage: "Justice and fair play demand that active opposition to the fraternities should cease so that they may have every opportunity to correct the abuses which they have fostered." This admonition can hardly be said to have been obeyed by the non-fraternity leaders. Those who were in touch with the situation from 1913 to 1915 will find it hard to decide which was more disappointing, the failure of the fraternities to make sophomore pledging effective, or the behavior of the non-fraternity leaders in student politics during these years.

The results of the regulation of fraternities have been good on the whole. The Faculty requirements have raised at least one serious and worthy problem in every chapter: namely, that of scholarship. Chapter existence has been absolutely dependent upon the ability of the given group to make consistently a scholarship average equal to that of the University. This necessity has urged a constant attention to the scholastic standing of fraternity members, and has become a significant factor in electing new members to the various groups. The publication of the scholarship averages of the fraternities has given a public and irrefutable record of merit, and the only official recognition of the standing of the individual chapters. The effect of this public record cannot be overestimated in any consideration of the accomplishment of regulation.

The pressure of the scholarship rule is bound ultimately to modify the aims of fraternity life. The regulations have introduced a new condition of existence. Where before, fraternities flourished largely on social pride or achievement in student activities, merit in which was difficult to determine and often spurious, it is now necessary also to succeed reasonably in scholarship, merit in which is a matter of absolute record. The sooner a given chapter develops the virtues necessary to exist under the new condition, the sooner will chapter life be freed from the spectres of humiliated pride, financial distress, and threats of extinction. The successful chapter must choose a responsible and fairly intelligent membership, and must then guard against the temptation to neglect scholarship for other activities of college life. To fall below the University average, for whatever reason, is not only an embarrassment, but a direct menace to the chapter life;

for the group is put at a serious disadvantage in its competition with other groups for members. Chapters that have been persistently weak in scholarship are certainly beneath envy, for they have existed chiefly as a burden to themselves and an embarrassment to their national organizations.

The declaration of war may be said to mark the close of the first period in the regulation of fraternities at the University of Texas. For the time being the full operation of the rules is suspended in concession to the extraordinary situation. But a definite stage has been reached in the attempt to regulate the scholarship of social groups in the student body. The principle of regulation has been clarified and stated in an effective set of rules; a successful method of computing scholarship averages has been developed; and the fraternities by full compliance have at last adjusted themselves to the Faculty requirements. Regulation is an established fact at the University. It is also a fact that the scholarship standing of fraternities has been appreciably raised by the regulations. That "pernicious political activities" and social exclusiveness as abuses in the fraternity system have been eliminated by an improvement in the scholarship of the fraternities is a matter of opinion. That a more responsive and intelligent attitude to these defects is clearly apparent among the fraternity students is unquestionable. It would seem to be the immediate problem of the national officers of the fraternities to consider the problem of making the fraternities more directly responsive to the needs of student life as a whole, and less directly concerned with the immediate interests of the individual groups.

APPENDIX I.

Argument of the Non-Fraternity Committee for the Abolition of Fraternities.

January 24, 1913.

To the President and Faculty of the University:

Gentlemen: We, the undersigned Executive Committee, representing the non-fraternity students of the University of Texas, herewith respectfully submit for your consideration a general

statement of the causes for the adoption of the resolution previously submitted. First, however, we desire to make one or two preliminary statements.

First: The present agitation for the abolition of fraternities from the University is not an ill-considered, sudden, or selfish movement. A committee of students, representing approximately two-thirds of the student body, have been at work on this problem for about two years; and a State-wide organization is being perfected for the purpose of abolishing fraternities from the two higher institutions of learning in Texas, where they still exist. Further, the student leaders in this movement do not represent any political faction, as has been charged. As a matter of fact, so far as student politics is concerned, it will be, we believe, to the disadvantage of non-fraternity men who may be seeking student offices, since recent developments in University politics show that elections will turn more and more on the result of the "Barb-Frat" division, and the non-fraternity students are, and doubtless will continue to be for a long time, in the majority.

Second: We have been criticized for appealing to the Legislature in advance of placing the matter before the Faculty or Board of Regents. In explanation, we desire to say (1) that we were advised that the University authorities as such had no power to abolish fraternities from the University, and (2) that the authorities would prefer to have such higher authority as is represented by the Legislature act in the premises, and so place the responsibility on the law-making power of the State in the first instance. Further, the non-fraternity mass meeting on January 8th was a result of a direct request by members of the present Legislature who wished to secure an expression of student sentiment regarding the matter. The resolution as adopted, therefore, was addressed to the Legislature, while appealing, at the same time, for co-operation of the President, the Faculty, and the Board of Regents of the University. Acting upon subsequent advice, however, and desiring to avoid, if possible, inviting Legislative interference with the internal affairs of the University, we laid the matter before the General Faculty.

We submit that the merits of our contention as to the abolition of fraternities from the University must be determined from the evidence of *conditions as they exist at the University of Texas.* So far as this discussion is concerned, the desirability of Greek-letter college fraternities in the abstract, or at some institutions, may be granted. Evidence both for and against fraternities at other institutions can, of course, be produced. But we submit that this question as applied to universities privately endowed, or where seventy-five to ninety per cent. of the student body belong to fraternities, or where a large proportion of the student body comes from wealthy parents, or where the environment as to the university and the state is non-prejudicial,—these and other considerations render abstract and analogous arguments largely irrelevant to this discussion.

The issues in this discussion, then, are: (1) Are fraternities detrimental to the best interests of our University? and, if so, (2) Is the abolition of fraternities the best solution of the problem?

We believe that fraternities at the University of Texas are an evil; that their presence in the University presents the most serious problem that confronts us at the present time; and that their abolition is the only solution of this problem. In urging what may be considered a radical solution of the problem, the burden of proof is, of course, upon us; and we submit, therefore, certain arguments and facts to sustain our position, and shall be glad to furnish more detailed evidence, either written or oral, if desired. If agreeable to your Committee, we beg leave to suggest that an approximately equal number of witnesses be summoned before your Committee to present evidence for and against this proposition, to the end that a full and impartial investigation of the question may be made, and that many details of evidence may be brought out which it is impracticable for us to present in this statement.

BRIEF OF THE ISSUES.

If we are correct in the analysis of the question, it must be shown that fraternities are detrimental to the best interests of the University. The term "best interests of the University" cer-

tainly includes (1) the united support of the people of the State, and hence the removal of all unnecessary causes of popular prejudice; and (2) a united student body—united in spirit and aims, and also united socially—so far as human nature, in the absence of artificial barriers, will permit.

Do fraternities interfere with the popular support of the University, and do they seriously hinder a united college spirit and student fellowship? These questions must be answered, we again suggest, by a first-hand study of *University of Texas conditions.*

It is to be borne in mind that the people of Texas are characterized by an intense democratic spirit; that the population is largely rural; that a large majority of the students come from rural districts (and for the purpose of this discussion, as compared with conditions in the East, "rural" may well include most Texas towns); that a large proportion of our students, therefore, are not natural candidates for fraternity membership, even should the fraternities at the University be increased in number sufficiently to accommodate them, and that these conditions will continue to obtain, both as to the State and as to its University, for many years to come. Much evidence can be adduced to show that the presence of fraternities in the University is the strongest factor in producing among the people of the State, more particularly the people in the rural districts, the impression that this is a "rich man's school" with strong aristocratic tendencies. It is no uncommon thing for a citizen to ask a student at the State University this question: "Does not a man have to belong to a fraternity there if he really is considered to be anybody at all?" The impression is current with a large element of our citizenship that a student must be a fraternity man to receive any recognition at the University, and that if he does not belong to a fraternity, he is considered of little account. To cite a specific instance, a member of the Legislature told a non-fraternity student at the State Capitol the other day that a friend of his told him a short time ago that he was going to the University of Oklahoma. On being asked by the Legislator why it was necessary for him to go to a state University outside of Texas, the young man replied: "Because

at Oklahoma a man is placed on an equal footing with other men, while at the University of Texas, it is a prevailing belief that, on account of the presence of fraternities, the students do not have an equal chance." In recent years this matter of fraternities at the University has been much discussed by teachers in the preparatory schools; and in many cases, students are advised either to join or not to join a fraternity, and in other cases they are advised to go to institutions where no fraternities exist. Last summer a man prominent in State politics (a former fraternity man at Princeton University) made a tour of the high schools in North Texas in opposition to fraternities at the State University. The people in the rural districts consider the fraternity as an aristocratic institution, and they think of the University as they do of the fraternity. In this and many other ways the prejudice against fraternities at the University is increasing among a large element of the people of the State, and agitation is growing more and more pronounced, and the result as to the interests of the University in relation to popular support is far more serious, we believe, than many of the University's friends, including members of the Faculty who are not in close touch with conditions in the State, are able to realize.

Turning to conditions in the University itself, the presence of fraternities and sororities has produced—and this is an evil that is growing more and more pronounced—a sharp and distinct line of cleavage within the student body in all forms of student activity and student interests. In the first place, there is a division of fraternity and sorority versus the non-fraternity and non-sorority element. There is a strong undercurrent of prejudice and feeling on the part of the non-fraternity students against those who are considered eligible for fraternity membership. This line of cleavage is fundamental to many other evils, and the evil results are all the more pronounced here, we again submit, by reason of the general personnel of our student body. There is a large element of the student body that feel that they are handicapped by reason of the artificial distinctions that the fraternities bestow, that they are underdogs in the fight, and that such artificial distinction and handi-

caps have no place in a state institution that is dependent upon popular support. This feeling of bitterness and resentment is more pronounced, perhaps, among the girl students. Thus, it is a known fact, in the case of two young ladies (and there are doubtless numerous other similar cases), that the humiliation they suffered in not being invited to join a sorority, caused them to leave the University. Thus most of the non-sorority girls and a large number of the non-fraternity men feel that they are condemned to social ostracism—and as a matter of fact they are—through the artificial barrier raised against them by the fraternities and sororities. The evidence of this fact, though intangible in a way—since those who have the strongest feeling against these artificial distinctions may be the very ones who would be the last to admit it—is nevertheless present, and thoroughly demonstrates that the underlying feeling of social injustice is none the less real.

It is a well known fact that a large proportion of the students are self-supporting; that while some fraternity members may aid themselves through student assistantships, yet no fraternity man performs such menial service as waiting on table, carrying papers, cutting wood, etc., as in the case of many barb students. Whether or not the waiting on table by a fraternity member would disrupt the fraternity chapter here, as was the case a few years since at Stanford University, the fact is that members of fraternities do no such work. This is one evidence of a division of the student body into fraternity and non-fraternity men on the basis of wealth, and this line of cleavage is growing more and more pronounced at the University. It is undeniable that it adds to the student's expenses to become a fraternity member, and recent developments show that our fraternities here are growing more and more ambitious to outdo each other in securing expensive and palatial chapter houses with fine appointments. The non-fraternity students, however, are in hearty accord with the sentiment expressed by President Mezes at the Dallas Fair last fall: "The only reason for the State University is the chance it affords the ordinary boys and girls in their efforts to get an education. The rich can educate their children in the univer-

sities of the North or in private schools. the poor cannot do this, but must rely upon the aid of the State. We are looking out for the poor; the others can look out for themselves."

Among the special causes of disunion within the student body may be mentioned the following:

In athletics perhaps the greatest discord and strife is apparent. Nearly every non-fraternity man on the football field the past season said that the excellence of the team was in a large measure injured because of fraternity control. This sort of criticism is prevalent in every form of athletics. An investigation of the election of the captain of the baseball team this year shows that nine men having a vote, four fraternity men and five barbs, the fraternity men voted unanimously for one candidate and the barbs voted solidly for another. Our present yell leader states that the members of a fraternity will yell if they have a fraternity brother on the team. Thus the fraternity spirit destroys or interferes with the unity of college spirit which, we submit again, is essential to the best interests of the University.

In our oratorical and forensic contests the same evil is present. Prior to the present system of having a committee of the Faculty as judges to select our intercollegiate debaters, it was charged by the non-fraternity contestants that fraternity men would try to secure members of their fraternity as judges, and the fraternity contestants would charge the barbs with unfairness in attempting to secure non-fraternity men. Under the present system, in case a majority of our intercollegiate debaters are fraternity men, the barbs will make a poll of the members of the Faculty committee that belong to fraternities, and prejudice and discontent are engendered as a result. We are not contending that there is any basis for such prejudice; but the main point is, that the students think there is, and this causes a lack of that generous rivalry which should characterize such contests. In this connection, while we think it can be shown that fraternities here, with the standards and aims that obtain, are detrimental to the highest success of the literary societies; but as bearing on the particular point under consideration, it has come about that certain literary societies are

developing into barb organizations and others into fraternity organizations.

Another cause of disunion within the student body is found in the Curtain Club. Non-fraternity men feel that this organization has come to be a "close corporation"; that only fraternity men belong to it or are permitted to belong to it; and that consequently membership in a fraternity is a prerequisite for eligibility, however well a student not belonging to a fraternity may be qualified to engage in this line of student activity. Strife and jealousy formerly existed within the Glee Club, and it is claimed by some that this was the cause of the abandonment of this University organization. The same general strife is present even in religious activities; and here again the feeling and prejudice underlying such strife may be thoroughly unreasonable and unfounded, yet the fact that it exists is simply another evidence of our contention that college spirit and student union are seriously affected solely because of the presence of fraternities.

In the matter of filling student offices, recent developments have resolved student politics into a barb-frat factional fight. The fraternity question has entered student politics at recurring intervals, but it was not until the abolition of the Final Ball last year that the barbs became solidly united into a faction and came into a realization of their power as an organized body. Now we do not contend, by any means, that the abolition of fraternities will abolish factional politics among the students, but we do claim that the present conditions, which will evidently continue to exist so long as fraternities exist here, affect most vitally the best interests of the University, and will continue to do so as long as fraternities remain in the University. Without going into all the phases of this problem, we submit that the barb-frat division in student affairs will be destructive, if not absolutely preventive, of the highest success of the student self-government recently inaugurated, and of the success of the administration by the students of the Honor System in the University. Already it is apparent, for example, that the barbs will elect, or attempt to elect, one of their own number as President of the Students' Association next year. The

one selected may or may not be the best representative of the student body as a whole. In other words, he will be elected by a faction rather than on his merits. In the administration of the Honor System this year, the non-fraternity students are feeling very restive under what they claim is a domination of fraternity men. Recently a fraternity man was tried before the Council and convicted, and two courses taken from him. A few days later a non-fraternity man was tried for the identical offense. The case, according to the contention of the barb members of the Council, was not as strong as that proved against the fraternity man; but in the trial of the accused barb, he was convicted and suspended for the rest of the year. In the Council meeting unfairness was charged, such unfairness being based, it was alleged, on fraternity affiliations. We submit that it is unnecessary to inquire into the merits of such a charge to prove that the successful administration of the Honor System in the future must be dependent upon the elimination of this barb-frat strife within the Student Council. The same line of argument applies to the Student Assembly, for already the parties to the strife are planning to secure majorities representing their particular side in this body next year. And this barb-frat line of cleavage, causing disunion and discord among the students, has been and is growing more and more pronounced.

There are certain inherent evils in fraternities themselves—at any rate so far as conditions in the University and in this State are concerned and in respect to the standards and conditions of fraternities as they obtain here at present. These evils are admitted by leading fraternity men themselves, evidence of which can be submitted if desired. But it is claimed that the evils of fraternities can be corrected. Granted that this is true (although for a long period of years we have had no evidence of the correction of such evils), we submit and insist that the improvement of fraternities will in no way affect the problem that has been presented. We respectfully submit that while you may thus help fraternities, this is no help to the barbs. Half-way measures do not meet the case. The conditions within the State and within the University which we have

outlined above clearly show that reformation will in no sense correct the evils that we have presented.

We have shown that the reformation of fraternities in no way solves the problem or removes the conditions that obtain and will continue to obtain in the State and in the University, nor will it remove the line of cleavage that divides the student body. It is claimed, however, that if fraternities and sororities are abolished, clubs with even greater evils will rise. Even granting, for the sake of argument, that clubs will be formed in the place of the present Greek-letter societies, we contend that such local clubs would, in no sense, give rise to the evils that obtain with reference to the people of the State and to the student body. In the first place, the stamp of a Greek letter gives the fraternities a name and an influence that no local club could afford. The secret Greek-letter societies have the backing and the prestige of a national organization. This affords them the same kind of prestige, both at the University and more particularly among people outside, as does the national organization of any other fraternal society—such as the Masonic Order, for example. Furthermore, the sentiment of the people of the State and of a large majority of the students in the University furnishes poor soil for the growth of exclusive social clubs. If 1,500 students, for example, can now get along without such clubs, we suggest that 2,000 students can and will. Considering the existing majority public opinion, which is essential to the enforcement of all laws, as it exists in the State and in the University, we have an abiding faith that the students and Faculty of the University will be able to cope with any unforeseen evils that may arise.

As we stated at the outset, we have no desire to prejudice other interests of the University by unduly agitating this question. We are inclined to the belief, however, that the danger of legislative agitation is over-emphasized by some of the friends of the University. Certain it is that the sooner the agitation ceases the better, but we believe that it will not cease until the problem is settled as we have suggested. Believing that the abolition of fraternities is absolutely necessary to insure united popular support of the University and a united student

body, and believing that the absolute removal of fraternities and sororities is the final solution of this question, we respectfully petition you to adopt this means of promoting the best interests of the State and of the State University.

RECOMMENDATIONS OF THE NON-FRATERNITY COMMITTEE, FEBRUARY, 1913. (See above, p. 5.)

To the Chairman, The Faculty Committee, The University of Texas.

DEAR SIR: We recommend the abolition of Greek-letter fraternities and sororities according to the following provisions:

1. After June 15, A. D. 1913, no man or woman shall under any conditions be bid or initiated as a member of any Greek-letter fraternity or Greek-letter sorority while a student in the University of Texas.

2. No man or woman entering the University of Texas after June 15, A. D. 1913, who shall be a member of any Greek-letter fraternity or Greek-letter sorority before entering the University of Texas, shall be permitted under any conditions to transfer his or her membership to, or in any way affiliate with, said organizations existing in the University of Texas.

3. The foregoing two sections shall not apply to students now in attendance at the University of Texas who are now members, or have been members, of said organizations at the University of Texas.

4. No man or woman hereafter entering the University of Texas, or who may now be a student at the University of Texas, and who is now a member, or has been, or may become, a member of any secret student organization whatsoever, shall be a member of another such organization while at the University of Texas.

5. No man or woman not a member of a Greek-letter fraternity or Greek-letter sorority, respectively, shall be permitted under any circumstances to reside in a Greek-letter fraternity or sorority house.

6. Any man or woman violating, either in letter or in spirit, the above provisions in whole or in part, shall be deemed guilty of a breach of the Honor System, and shall be subject to expulsion from the University of Texas.

7. Any student who participates in an attempt to bid or initiate, or in any manner procure members for any Greek-let-

ter fraternity or Greek-letter sorority existing at the University of Texas, shall be deemed guilty of a breach of the Honor System, and shall be subject to expulsion from the said University of Texas.

We suggest the following regulations for any secret organization, or organizations, or students as such, that now exist or may hereafter spring up at the University of Texas:

1. Membership in any secret organization, or organizations, shall be begun by application on the part of the person desiring membership, and not by invitation from those already members.

2. No man or woman shall be a member of such organization, or organizations, unless he or she shall be a bona fide regular student in the University of Texas for at least one scholastic year immediately previous to joining, and shall have passed four (4) regular courses in said University of Texas with an average of "C," or its equivalent in the Law Department, for the session directly preceding his or her becoming a member.

3. Any man or woman who may have at any time become a member of said organization, or organizations, and shall fail to make or keep the average above (see paragraph No. 2.) provided for, shall be automatically dropped from membership in such organization, or organizations, and shall in no way participate in any of its meetings or activities, and such person shall not be reinstated until he or she shall again have fulfilled the admission requirements.

4. It is further provided that any student who shall be dropped from the membership of such organization, or organizations, shall move his residence, if residing at the organization house, until he or she may have become reinstated.

5. Any man or woman violating, either in letter or in spirit, the above provisions, in whole or in part, shall be deemed guilty of a breach of the Honor System, and shall be subject to expulsion from the University of Texas.

6. Any man or woman who participates in any attempt to initiate, or in any manner procure, members who are ineligible for membership in said organizations, or retain ineligible members, shall be deemed guilty of a breach of the Honor System, and shall be subject to expulsion from the University of Texas.

APPENDIX II.

ANSWER OF THE FRATERNITY COMMITTEE TO THE ARGUMENT FOR THE ABOLITION OF FRATERNITIES, FEBRUARY, 1913.

(See above, p. 5.)

To the Faculty Committee Investigating the Fraternity Situation at the University of Texas:

At the outset the fraternity men of the University wish to assure the Faculty that they heartily commend the action of the President in appointing a committee of Faculty members to inquire into and report their findings on the complaints that have been made by certain non-fraternity men of the University against fraternities. We realize fully that fraternities present some features that do not meet with the approval of the Faculty. No organization is perfect. The same features are disapproved by the fraternity men themselves. However, we wish to point out the fact that strong effort is being made voluntarily by the fraternities to remove the causes for such complaint, and that assistance by Faculty members will be welcomed.

It will be observed that this is merely a general statement of the position of the fraternities. We desire to say specifically that oral testimony will be given in further setting out the fraternity situation as we know it. It is evident that a full written statement of all facts supporting the position of the fraternities would unduly prolong this paper.

Several days since, a committee of seven non-fraternity men purporting to represent the fifteen hundred and ninety non-fraternity students of this University, prepared a statement of the grounds on which those who are actively engaged in the fight against fraternities base their opposition.

We presume this statement includes the most important, if not all, the complaints charged to fraternities. We therefore submit to you our reply to the stated objections, holding ourselves ready and willing to answer additional arguments as they may be suggested by the non-fraternity leaders.

As your Committee will observe, this reply consists of two parts: (1) an answer to the statement submitted by non-fraternity men, (2) a statement of the advantages which we fairly believe are to be had thru fraternities. In this way the argu-

ments against fraternities (contained in the Pamphlet) and those for the fraternities will be balanced, and your Committee, therefore, will be enabled better to compare and weigh the two.

The non-fraternity men set out as their main objection "that fraternities are detrimental to the best interests of the University," and define "best interests" to mean (1) the united support of the people of Texas, and (2) "A united student body, so far as human nature, in the absence of artificial barriers, will permit."

Do fraternities interfere with the united support of the University of Texas by the people of Texas? The non-fraternity leaders answer in the affirmative, and aver that fraternities are the "strongest factor" in producing the impression that this is an aristocratic and a "rich man's school"; hence our people will not unitedly support a school that is both aristocratic and only for the rich.

A study of the situation in Texas will contradict such a statement. We only have to call your attention to the fact that in the western and eastern parts of Texas and in the sparsely settled sections in between, the University is least known. Practically no idea is had there of the work it is doing. Great numbers of those people do not even know, as has been said by President Mezes, that there is such a thing in existence as the University. Certainly in those districts where so little is known about the University, even less is known about fraternities. We believe it can be truthfully said that the vast majority of those people have not the faintest idea that there is such a thing in the world as a college fraternity. Yet in those sections the idea is most prevalent that the University is "a rich man's school."

On the other hand the University is best known, and fraternities are most widely advertised, among the people of our cities and large towns, such as Dallas, Fort Worth, Houston, San Antonio, Sherman, etc. There the vast majority of people are more thoroughly acquainted with the University, and are best informed about fraternities; yet, in those places, the idea is least prevalent that the University is a rich man's school.

The fallacy of such a statement on the part of the non-fraternity leaders is rendered still more obvious when you are re-

minded of the methods by which the University is advertised, to wit:

(1) Thru the newspapers.

(2) Thru pamphlets, etc., sent out by the University.

(3) By the students themselves.

Do the newspapers advertise us as a rich man's school? The number is negligible.

Do the pamphlets advertise us as a rich man's school? Certainly not.

If we are so advertised at all, then it must be thru our own students. And the idea that the University is aristocratic and only for the rich, if gained at all, must be got thru our people's first-hand knowledge of the individuals coming from the various communities to the University. And we submit as a fact that the same boys and girls would, in most instances, come to the University, whether fraternities existed here or not.

We submit further that the only ways in which fraternities can possibly interfere with popular support of the University are: (1) In preventing our people sending their children to the University, for if there is a popular prejudice against us there will necessarily be a popular prejudice against sending boys and girls here for schooling; (2) in preventing adequate appropriations by the Legislature, since it is a conceded fact that the Legislature reflects popular feeling in Texas.

In answer to the first: We cite the Regents' Report for the years 1910-1911, 1911-1912, page 35, in which the percentage of increase of our student body has been 48 per cent. in four years and 20 per cent. in the past two years. We also call your attention to the fact that we have more students now in the University than can properly be cared for.

As to the second: Upon careful consideration of the facts, it appears that the fraternities in the University have nothing to do with our inadequate appropriations. The Legislature is equally parsimonious with the State Normals, the A. and M. College, the College of Industrial Arts, the Schools for the Deaf and Dumb, and the Blind. But these schools have no such associations as fraternities. Another reason than this must be found for our inadequate support.

We submit that the true reason for any popular or Legislative prejudice, if there be such, lies in the fact that many of our agricultural people have failed to see any direct benefits accruing to our agricultural interests through the University.

In the above we have endeavored to confine ourselves as nearly as possible to a statement of facts, and the fair conclusion is, it seems to us, obvious that such a contention on the part of the non-fraternity leaders is without foundation in fact, and finds its source in the minds of a few enthusiastic non-fraternity leaders who are fomenting the present agitation.

The second charge made against fraternities is, that they prevent a "united student body, so far as human nature, in the absence of artificial barriers, will permit."

As a specific example of this, it is said that "as a matter of fact most non-fraternity women and many non-fraternity men are condemned to social ostracism" (Page 10, Pamphlet) by the existence of fraternities. The above statement is made in face of the fact that the girls' social clubs, Anglers and Rabbit Foot, The German Club, and the girls' and men's literary societies take in fraternity men and women and non-fraternity men and women on an equal footing. It is further pointed out that in all class and departmental functions, in all club functions, and in all purely public fraternity functions, fraternity men and women and non-fraternity men and women are invited indiscriminately and mingle together with the greatest freedom and on the friendliest terms. (Oral testimony will be given in further substantiation of this.)

The non-fraternity leaders charge that in "athletics perhaps the greatest strife and discord is apparent," and "that nearly every non-fraternity man on the football field the past season said the excellence of the team was largely impaired by fraternity control." Nothing is easier than to make a general complaint like this, for there are always with us those who, not having made the team, are the first to cry it down. But we believe that if an attempt were made to choose over again the football team for the past season, great difficulty would be experienced in choosing men more fit for the various positions than were selected by Mr. Allerdyce, Mr. Rix, and Mr. Disch.

If, however, this charge against the coaches and Athletic authorities were true in a single instance, would it be an argument for the banishment of fraternities? Would it not be wiser and more just to discharge those coaches who are unable to withstand the influence of a few college boys rather than banish an institution that is working constantly for the betterment of the University and the uplift of its members? We believe the coaches were fair, honest, and just, and that the entire student body will endorse their work. (Further proof will be given orally.)

Again, it is asserted that fraternity men will yell if they have a brother on the team, the insinuation being that they will not yell if they do not have a brother on the team. And it is further alleged that less than fifty per cent. of the fraternity men sit in the cheering section. We assert that the fact that a few fraternity men are on the team is a small factor in drawing out their fraternity mates to the games, but all students cheer alike for the team. We insist that no football men have been cheered with greater unanimity or have been greater popular idols than Householder, the Ramsdells, Parrish, the Harolds, Kirkpatrick, and Littlefield. Yet none of these men was a member of a fraternity. Your Committee knows that there is little or no individual cheering, except for sensational plays, and that whether the player so performing be a non-fraternity or a fraternity man. We doubt whether any man could tell what percentage of fraternity men sit in the bleachers to cheer, but suppose that less than fifty per cent. of the fraternity men do sit there; the remainder sit in the opposite section, most frequently in the company of young ladies, and there as enthusiastically support the team with their cheers and patronage. The same men would in most cases sit in the grandstand whether members of fraternities or not; hence an abolition of fraternities will bring no change.

The non-fraternity leaders argue in the next place that in oratory and debating, in the Glee Club and the Curtain Club, there is a feeling that the fraternities dominate, and go on to say that "we are not contending that there is any basis for such prejudice" and "that such prejudice and feeling may be thor-

oughly unreasonable and unfounded, yet the non-fraternity students think there is," therefore the fraternities should be abolished. With reference to the allusion to the Glee Club, Mr. W. E. Metzenthin, who was intimately connected with the Glee Club for years, states that in so far as he knows or has been able to find out, such charge is without foundation. (We suggest that Mr. Metzenthin be asked to appear before your Committee.) So far as the other contentions are concerned, we are unable to see how any reasonable man could be led to vote for ousting fraternities simply because a certain element of the students feels that such and such a condition exists, even though such element admits that they "do not contend that there is any basis for such prejudice." In other words, if an element of our students should feel that B. Hall is a nuisance, though there be no foundation in fact for such feeling, yet B. Hall should be razed by the Faculty. The position of the non-fraternity leaders is so palpably untenable in this regard, we feel that no one can or will attach any importance to it, except as demonstrating that the non-fraternity leaders are groping about, not for arguments to abolish fraternities, but for arguments to sustain themselves in the position they have assumed.

The reference which the non-fraternity leaders make to the Students' Council is most unfortunate, the inference there being that the fraternity man was more guilty than the non-fraternity man, but the punishment of the latter was more severe than for the former (Pamphlet, p. 13). We call your attention to the fact that a majority of the Council members are non-fraternity men, as is also the case in the Students' Assembly. We also append hereto as Exhibit "A" a statement by the Students' Council.

The first fraternity was established in 1776 by Thomas Jefferson. Today fraternities are found in every state university in the United States with the possible exception of Arizona and New Mexico, and in more than three hundred other colleges and universities. They number three hundred and seventy-one, have a combined membership of 389,000, and a total property valuation of more than ten million dollars. Their

continued existence and growth create the presumption that they satisfy a certain demand and have certain advantages.

What demand is it that they satisfy?

Every man can have a broad feeling of brotherhood toward all other men, but he can have that intense affection found within the home circle, toward only a limited number. So every student can be friendly toward every other student, but he can have an intense feeling of brotherly esteem and affection toward only a limited number of close and congenial fellow-students. The fraternity is in college the substitute for the home, in that it furnishes a group in which this intense feeling of brotherhood and kinship can flourish. Whenever men are without homes, they have clubs as substitutes; there are clubs of every description in every place where men or women congregate in large numbers. No body of men and women is so isolated from home and its atmosphere as men and women are in college, and none feels the need more. They must have substitutes, since it is inbred in men and women to gather in groups where they can meet and be with their fellows of like tastes and temperaments.

What are the advantages of fraternities?

First as to the members:

1. They furnish each member with a college home.

2. They strive to develop team work, unselfish regard for others, a knowledge of men, qualities of leadership, business ability, and a sense of responsibility.

3. They provide each member with a comfortable boarding place at reasonable rates, and under the proper rules of conduct.

4. Fraternities give their members added incentive to do their best and to conduct themselves properly, since their actions must reflect either credit or discredit upon their organizations.

5. The freshmen of fraternities have the advice and supervision of upperclassmen and are under certain scholastic requirements, since they must pass in four courses in one term before they are eligible for initiation.

6. Fraternities bind their alumni to the University in a way that can be done in no other. Each member has a home to which he can return on visits to the University after he has left the University.

7. Fraternities give their members broader inter-collegiate ideas by the fact that the chapters in different colleges bind those colleges into a closer unit, by the fraternity publications, and by intercourse between members of chapters at other colleges.

Advantages to the School:

1. The fraternities draw alumni closer to the University.

2. They keep the alumni in close touch with the University by drawing them back frequently for visits to the fraternity homes, and by and through the chapter letters sent out at regular periods.

3. They make students more active in advertising the University and in bringing students here. (Oral testimony will be adduced on this point.)

4. The chapter houses furnish room and board for twice the number of students that are housed in our only dormitory.

5. Fraternities serve as convenient units, (a) for the administration of Faculty discipline, (b) for the notification of alumni of measures concerning the University, (c) for putting before the students all manner of student activity, such as Y. M. C. A. work and other religious activities.

6. They serve to strengthen good inter-collegiate feeling, men in different colleges having common ties.

It is claimed that the benefits of fraternities are largely limited to a few. This certainly is not the fault of the fraternity. Although from their very nature and from the nature of the demand they satisfy, each local chapter must have a limited membership, yet there is no limit to the number of chapters that may be established. The fraternities in the University have always favored the establishment of additional chapters. As the advantages of fraternities are recognized, they will continue to grow in number until there shall be enough fraternities for every student who desires to belong to one best suited to his tastes and his means. Such is already the case in the

older colleges and universities. And it is only a question of time when it will be so here. A sorority was added to our number last year, a fraternity will be added this month, and in addition there are three local clubs which will, in time, be fraternities in name as they are now in fact.

Every college and university in the United States has either its fraternities or its clubs. The history of a century shows that no university has for any length of time existed without them. This University will prove no exception if fraternities are banished. Local clubs are certain to spring up. They may be secret or non-secret. The result will be the same. The only thing about a fraternity now that is secret is the motto and the ritual. That the college fraternity is more to be desired than the local club no man who will give the question a moment's thought will doubt. (Further evidence will be given orally.)

Some of the more apparent advantages of fraternities are the restraining influences of the national officials, the national publications, and the alumni both in and out of the faculty, and greater susceptibility of fraternities to discipline and control—the very fact that they might be abolished making them more subject to regulation.

Local clubs on the other hand have none of the restraining influences of the older men—either undergraduates or alumni—because they are an intangible sort of thing and cannot be reached as can the fraternity. They cannot be legislated against, and are therefore not susceptible to proper regulation and control. (See history of Princeton.)

In conclusion, we suggest that your Committee inquire into the conditions of schools, such as A. and M. College, Princeton, Yale, University of Mississippi, etc. As we understand it, in the three first named the club system exists, in the last named fraternities have been abolished. Again, it will be observed that this is merely a general statement of the position of the fraternities. We wish it expressly understood that oral testimony will be given in further setting out the fraternity situation as we see and know it, since it is evident that a full written statement

of all the facts supporting the position of fraternities would unduly prolong this paper.

Signed: L. S. Hoffman.
T. Hardie.

Exhibit A. We, the undersigned members of the Students' Council, in view of an assertion printed in a pamphlet which has gained wide distribution in the University community, take this means to expressly deny that our individual deliberations or votes have been in any wise affected by the fact that some of the members of the Council are non-fraternity men while others are fraternity men, or by the fact that any of the students whom we have tried for breaches of the Honor System were non-fraternity men or fraternity men. In entering upon the duties of Councilman, we take an oath to perform such duties without reference to our outside affiliations with clubs, fraternities, and the like.

Signed:

Edward F. Ries.	J. C. Jackson.
J. L. Jackson.	D. L. Hoopingarner.
Ray Holder.	J. E. Daugherty.
Hugh Potter.	W. B. Hamilton.
Oscar K. Greene.	W. H. Caldwell.
R. C. Bibb.	C. M. Strauss.
R. D. L. Killough.	H. R. Frits.
I. H. Burney.	Olin Hockaday.

APPENDIX III.

Report of the Faculty Committee Appointed by President Mezes to Investigate the Status of Fraternities at the University of Texas.

This report is accompanied by two exhibits, A and B, which give the detailed facts upon which the conclusions are based. These exhibits are to be found in the minutes of the General Faculty for the session 1912-1913.

To the Faculty of the University of Texas:

The Committee on Fraternities and Sororities, appointed by President Mezes at the request of the Faculty Council, submitted the following report, which was approved by that body and referred for final action to the General Faculty:

The Committee (1) has had numerous conferences with representatives of the anti-fraternity students, with fraternity and sorority delegates, with selected non-partisan students; (2) has obtained from these representatives written information covering specific points; (3) has studied much relevant literature of recent date; and (4) has thoroughly discussed in many meetings most, if not all, of the aspects of a complicated situation.

Two important considerations should be mentioned at the very beginning.

(1) The Faculty of the University of Texas has in the past pursued a rather *laissez faire* policy in regard to many student activities, and in particular with regard to fraternities and sororities, which officially have been scarcely recognized. To regulate or abolish fraternities and sororities would, therefore, mean a fairly radical change of policy.

(2) Student government as now organized at the University involves the delegation by the Faculty to the student body of the control of many student activities. By action of the Board of Regents, and in accordance with common sense, the Faculty may not vest any absolute control in the student body, thus shirking its legal responsibility; and student legislation is, therefore, subject in all cases to the veto of the President of the University. The Faculty can, however, delegate such powers to the students as the student body is capable of using with reasonable

effectiveness. The fraternity question seems too complex for solution by the student body alone.

PRINCIPAL FINDINGS OF THE COMMITTEE FOR AND AGAINST FRATERNITIES.

A. For Fraternities.

1. Students have a right to organize in friendly groups, and will do so.
2. Fraternities have built many houses and have attempted to form college homes.
3. Fraternities officially cherish decent social ideals.
4. Fraternities promote friendly intercollegiate acquaintance.
5. Fraternities tend to tie their alumni to the University.

B. Against Fraternities.

1. The average scholarship of fraternity members is below that of the other students.
2. False and unfair social discrimination is intensified by fraternities.
3. Political activities of fraternities are a prolific source of student dissension.
4. Fraternities, while not always, nor necessarily, expensive to their members, have allowed themselves to become the instrument, or means of expression, of most of such extravagance as now goes on at the University.
5. Fraternities under a system of unrestricted pledging give what are often regarded as college decorations to those who have not made good in the college arena.
6. Rushing activities constitute a grave evil.

The Rights of Fraternities.

The full social liberty that belongs to adults cannot be wisely granted to students. Still it is highly desirable, for educational reasons, to allow students as much liberty in the management of their social life as they can wisely use. Greater freedom than was enjoyed in the preparatory school should be allowed to university students in order that they may learn greater responsibility.

Students, like adults, have a right to gather into congenial groups, and this right has been almost universally recognized in American universities and in the universities of the Old World for centuries past. When such groups are formed, they naturally fall either into honor groups, groups whose membership have applied for admission, or invitation groups. Honor groups should be eliminated from the present discussion as not being primarily social. If invitation clubs are prohibited, then groups whose membership is based upon application must exist. If the application groups are permitted to exist, they must either have or not have the right to refuse admission in particular cases. If the right to refuse admission is granted, clubs operating under this rule cannot be prevented from becoming invitation groups. If the right to blackball be denied, there is an end to all privacy; when privacy ends, the social group is destroyed.

It would seem, therefore, that students should have the right, under appropriate restrictions, to form self-perpetuating invitation clubs provided they confine their activities to the proper sphere of a social group, and do not infringe upon the rights of others. In this connection it may be stated that young women have the right to accept or reject the acquaintance, or company, of any man without necessarily raising the imputation of snobbishness or exclusiveness.

Social clubs should have the right to maintain houses, at least until the University is able to provide dormitories, it being understood that these houses are established to provide home influences and to generate a spirit of mutual helpfulness in the members.

The intercollegiate character of fraternities is in some respects an advantage. While "black sheep" chapters may and do exist, the average of all the chapters of any fraternity is generally at least fair. In dealing with delinquent chapters, college administrators can therefore bring to their aid the national officials of the fraternity. Moreover, the intercollegiate character of the fraternities tends to broaden the student's outlook and college sympathies.

Improper Activities of the Fraternities.

It is the opinion of the Committee that the fraternities and sororities at the University of Texas have not confined themselves to their proper sphere of activity. They have gone out of their sphere in various ways.

They are one of the principal disturbing factors in student politics. This is due to the fact that they form permanent compact minorities, and chapters often trade their solid votes among themselves. Quasi-secret political combinations and voting in blocks at the direction of leaders are real evils, and are especially objectionable in a state university.

Because of their permanent organizations, by attaching labels and in other ways, fraternities have tended to exaggerate social distinctions artificially.

They are in part guilty of an assumption of superiority, often not well founded, which is quite irritating to some outsiders, and which is sometimes injurious to non-fraternity students and always to the members themselves.

It is the conclusion of the Committee that the existence of sororities in the University is responsible for a large proportion of these evils.

In so far as fraternities injuriously affect the social and moral welfare of college life and scholastic efficiency, they come under the disciplinary jurisdiction of the Regents and the Faculty. Social organizations of a private nature, such as fraternities and sororities, should not emerge or operate consciously in University student affairs, e. g., athletics, glee club, debating, literary societies, dramatics, politics, and social functions. Outside of the chapter house, and especially on the campus and in the class room, it is highly desirable, as well as in good taste, that the fraternity affiliation should not appear.

Considerations Preliminary to the Recommendations.

Among the main aims of a state university two deserve emphasis in this connection: (1) to furnish well trained men and women necessary for the state's welfare; (2) to make good citizens with democratic sympathies of those who seek a higher education and who are later perhaps to become leaders in the state. The conditions under which students live in such an institution

are for the foregoing reasons a matter of public concern; and the citizens of a democracy have a right to demand that undemocratic tendencies should not be fostered in a state institution supported by public taxation.

There is little hope that fraternities as now constituted will renovate themselves without assistance from the Faculty. Regulation by the Faculty has therefore been recommended. The regulations proposed below by the Committee deal almost exclusively with scholarship, but are expected indirectly to reduce, if not to cure, the other evils of the present fraternity system.

The Committee finds after careful consideration that the various protests against the fraternities rest, in their last analysis, upon two things: (1) the social exclusiveness of invitation clubs; (2) the political activities of such clubs. The Faculty wishes to stress in any criticism of the fraternities the low scholarship of the members.

Recommendations.

In view of the foregoing facts and considerations, and of those presented in the appendices to this report, your Committee recommends that fraternities be not immediately abolished, but be subjected to the regulations immediately following; whether abolition shall prove necessary in the future will depend on developments.

Proposed Regulations.

1. Before students can be initiated into fraternities, sororities, or like organizations, they must have passed in one long session at least four courses of regular work counting toward degrees, or four and two-thirds courses in one long session and the subsequent Summer School. Students coming from other colleges shall be subject to this rule, except that those credited here with at least four courses toward a degree for work done during their last year of attendance at the institution from which they came, may be initiated on the completion of twelve hours of work in one term. If, however, they fail to complete twelve hours of work during the first term of attendance here, they must comply with the first provision of this regulation.

2. Members of fraternities, sororities, or like organizations, may not board or lodge in chapter houses, or like club houses, unless they passed in at least twelve hours of class work in the preceding term; and members boarding or lodging in chapter houses, or like club houses, who at the mid-term reports are found to be doing passing class work in less than twelve hours of class work, or who at the end of a term fail to pass in at least twelve hours of class work, shall cease to board or lodge in the chapter house, or like club houses, and may not return until they complete at least twelve hours of class work in a subsequent term.

3. No student who is not a regular member of the fraternity, sorority, or like organization, may room or board in a chapter house.

4. Pledging for any academic year shall not take place before September 15.

5. Each sorority must have a suitable chaperone subject to the approval of the Dean of Women.

6. In every chapter house, or club house, there shall be a resident member who shall have received the approval of the Faculty Committee on Student Social Organizations. This member may be a senior student, a graduate student, or other person approved by the Committee, and shall be responsible to the Committe of the Faculty for the carrying out of these regulations and reforms.

7. There shall be appointed a standing committee of the Faculty on student social organizations whose duty it shall be to attend to the enforcement of these regulations.

Conclusion.

To recapitulate, it is the judgment of the Committee, based in part upon the following reasons, that the immediate abolition of fraternities would be unwise: (1) It would be unjust to abolish without warning, and before any opportunity for reform has been offered. (2) Abolition would not eradicate wholly the evils of social exclusiveness and snobbishness, unfair political activity, and low scholarship, for which the fraternities are now in part responsible, but which are caused by the weakness of human nature. (3) Immediate abolition would destroy the potentialities for good which fraternities offer, and would consequently take away rights which the students should enjoy so long as they are

wisely used. (4) Since it has become evident that many of the abuses are due to the immature members of the fraternities, the Committee expects that raising the average intelligence of their membership will enable them to remedy the other evils at present arising from the fraternity system. These regulations should stimulate the fraternities to make every effort to preserve themselves. It is incumbent upon them to make the one-year rule effective, to cease pernicious political activities, and to eliminate their snobbishness. If they do minimize these grievances, we feel confident that the good judgment and sense of justice of the student body will welcome the continuance of the fraternities. If they do not appreciably reduce these grievances, the Committee feels that the fraternities are doomed.

Justice and fair play demand that active opposition to the fraternities should cease so that they may have every opportunity to correct the abuses which they have fostered. Those who do not refrain from such interference while the fraternities are conscientiously attempting to reform will justly be held responsible, in a large measure at least, for any failure which may occur.

It is our unanimous opinion that a fair trial of these regulations should be made for two years. If at the end of this period of probation, impartial investigation should find that the system is still a source of serious grievance, it is our united and emphatic recommendation that more drastic action than is now proposed shall be taken.

On Friday, April 22, 1913, the General Faculty adopted the recommendations of the foregoing report and declared them effective June 10, 1913.

Attest: John A. Lomax, Secretary of the Faculty.

APPENDIX IV.

PETITION PRESENTED TO THE COMMITTEE ON SOCIAL ORGANIZATIONS. THIS MATTER WAS BROUGHT UP IN THE GENERAL FACULTY MAY 13, 1913, AND REFERRED TO THE FACULTY COUNCIL FOR ACTION.

(See above, p. 8.)

The Pan-Hellenic Council, representing the fraternities of the University of Texas, respectfully petitions your Committee to make the following changes in the rules announced regulating the fraternities:

1. That fraternities be allowed to pledge eligible freshmen on the third Wednesday in May of each year, provided that any bid shall lapse in the case of a pledge failing to make the required four courses in the spring term.

This change is requested for the following reasons: (1) As the rules now stand, it will be practically impossible for this Council to prevent rushing and pledging of men during the summer months, with the abuses and expenses that such a condition will entail. It is hereby understood that this Council will adopt satisfactory rules regulating the rushing and pledging of eligible students during the school session. (2) The adoption of this change will give the fraternities something definite to count on for the following fall, put them on a sounder financial basis, and thus enable them to make proper contracts for the following year for homes and other necessities for the running of a chapter house.

2. That the scholarship rules regarding those boarding in fraternity houses be removed, retaining the rule only as to roomers therein.

This change is requested for the following reasons: (1) This feature of the rule does not affect the scholarship standard of the fraternities, as some have urged that rooming in a chapter house may do. (2) It will be well nigh impossible to provide board in fraternity houses so long as it is rendered impossible to approximate the number of boarders to be had. (3) It will be a severe financial strain on a few members of fraternities, in the event that other members are not allowed to board in the

fraternity houses. (4) The rule as it now stands will take away one of the chief advantages of fraternities, the ability to give its members better and cheaper board.

The Pan-Hellenic Council desires to advise your Committee that the Pan-Hellenic Council will adopt suitable rules governing the rushing and pledging of men, so as to prevent a recurrence of the undesirable features heretofore connected with rushing. Such regulations will in part consist of the bidding of eligible students by written invitation on the day indicated above. This will effectually prevent "congestive" rushing in any period of the school year.

In asking that the above changes be made, we desire to assure your Committee that we have no desire other than to see the rules announced put into successful operation. But we believe as the rules now stand we shall encounter serious difficulty in properly carrying them out.

RULES ADOPTED BY THE MEN'S PAN-HELLENIC COUNCIL, MAY, 1913.

(See above, p. 8.)

I. Rushing:

1. Non-fraternity men who are not eligible to membership in a fraternity under the existing rules of the Faculty shall not be entertained by fraternity men with down-town dinners or lunches, the theatre, drives, or athletic contests, or any form of entertainment involving expense.

2. Non-fraternity men shall not be entertained at a chapter dance or reception or function of like nature given by a fraternity.

3 Non-fraternity men may be entertained after January 3 at a chapter house or at meals or at smokers, provided that any one man be not invited oftener than once in any one month to the same house, and provided further that not more than four are so entertained at one house at one time. An exception to this last provision may be made in the case of a smoker, which may not be given oftener than once a month by any chapter, but the number of men to be invited shall be left to the discretion of the chapter.

4. There shall be no rushing of any kind from the third Tuesday in May till the Sunday following spring term examinations.

II. Pledging:

1. Bids shall not be given earlier than the third Wednesday in May, except to such as may be eligible earlier, as hereinafter provided for. Bids shall be required to be answered within a week. A pledge dependent upon passing spring term examinations shall lapse in case the person so pledged fails on those examinations.

2. To men becoming eligible after the fall term, bids may be mailed not earlier than January 3: and to those becoming eligible after the winter term, not earlier than the second Monday following the week of examinations. These bids are in all other respects subject to the same rules as those in May.

3. Bids shall be written and mailed, and shall be worded according to the standard form adopted by the Pan-Hellenic, said form to be used by all chapters and not to be changed by any one of them. No intimation shall be given to any man that he is likely to receive a bid. Those receiving bids shall be requested to return them with their answers, whether accepting or not.

4. No rushing of any kind shall be allowed from the time a bid is sent till it is answered, and the subject must not be mentioned to the recipient during that time by the senders.

5. Bids may not be sent to anyone who shall not have an average of at least D in four courses at the time of bidding.

III. Initiating:

A pledge may not be initiated until he shall have credit on the books of the Registrar for the full amount of work required by the Faculty for eligibility. Those pledging in the spring dependent upon making spring examinations may not be initiated until registration week of the following fall.

RULES ADOPTED BY THE WOMEN'S PAN-HELLENIC COUNCIL, MAY, 1913.

(See above, p. 8.)

I. Rushing:

1. Rushing is defined as expenditure of money.

2. There shall be no rushing of any kind until the beginning of the second term, and a sorority may have only one date a month with the same non-sorority girl.

3. One social function a term may be given at the chapter house. This will not count as rushing, provided both frat and non-frat people be invited.

4. No non-sorority girl, who is a University student, shall be entertained at "open house."

5. Exception shall be made in the rushing of all first year students who have sisters in the chapter.

6. All entertaining shall be done in the sorority house.

II. Pledging:

1. Bids shall not be given earlier than the third Wednesday in May, except to such as may be eligible earlier. Bids shall be required to be answered within a week. Bids shall lapse provided the pledge fails to make the required work in the spring examinations.

To those becoming eligible after the fall term, bids may be mailed not earlier than January 3; and to those becoming eligible after the winter term, not earlier than the second Monday following the week of examinations. These bids are in all other respects subject to the same rules as those in May.

2. Bids shall be written and mailed, and shall be worded according to a standard form adopted by the Pan-Hellenic. (Exception shall be made of those chapters who already have formal bids.) No intimation shall be given any girl that she is likely to receive a bid. Those receiving bids shall be requested to return them with their answers, whether accepting or not.

3. No rushing of any kind shall be allowed from the time a bid is sent until it is answered, and the subject must not be mentioned by the senders to the recipient during that time.

4. Bids may not be sent to any one who shall not have an average of D in four courses at the time of bidding.

III. Initiation:

1. A pledge may not be initiated until she shall have credit on the books of the Registrar for the full amount of work required by the Faculty for eligibility. In case of those pledging in the spring dependent upon passing spring examinations, initiations may not take place until registration the following fall.

APPENDIX V.

REPORT OF DEAN TOWNES ON VIOLATIONS OF THE "HOUSE RULE," SESSION OF 1913-1914, JUNE 4, 1914. (See above, pp. 10-15.)

Dr. Sidney E. Mezes, President of the University.

DEAR SIR: The Discipline Committee, to whom were referred complaints against a number of the fraternities for alleged violations of the "house rule," begs leave to submit the following report.

The Committee had several conferences with Dr. Parlin, Chairman of the Committee on Student Social Organization, in which we got his general view of the situation. Reliable statements had come to him as to violations of the "house rule," and he had taken the matter up with the different fraternities.

From this preliminary investigation, it seemed necessary to investigate further the following fraternities: Phi Delta Theta, Sigma Chi, Kappa Alpha, Chi Phi, Beta Theta Pi, Kappa Sigma, Sigma Alpha Epsilon, and Phi Gamma Delta. Our Committee saw the student representatives of each of the fraternities named, and in some instances saw other members. In every instance the students were very candid, trying to put the Committee in possession of the pertinent facts.

To understand the situation properly, it is necessary to go back to the Faculty regulation passed near the close of last session, a copy of which is hereto attached. All during the session of 1912-1913, a good deal of general discussion was indulged in both by members of the Faculty and students as to the desirability of some sort of fraternity regulation. Sometimes the discussion went so far as to include fraternity abolition. The situation clearly demanded Faculty action. The Faculty appointed a Committee to look into the matter and make recommendations. It had many sessions and earnestly endeavored to reach the proper solution for the many admitted difficulties in fraternity life. The Committee reported to the Faculty substantially the regulations as ultimately adopted by that body.

The real purpose of the Committee in formulating its report, and of the Faculty in adopting the regulations, was to improve

and strengthen scholarship in the several fraternities. It was earnestly believed that as to this matter the Faculty had unquestionable jurisdiction, and could make such reasonable regulations with the purpose of securing better scholarship as it saw fit. From that as a base the several suggestions were discussed and passed on. Rules 1, 2, and 4 deal directly with matters of scholarship. These constitute the real gist of the regulations, the other rules being incidental to these.

These rules were promulgated, and were received by the fraternities generally without active opposition. Some of them were thought by some members of some fraternities, if not by some fraternities, to be severe and undesirable, but no active opposition or open resistance was offered. Your Committee, however, fears that the real purpose of the Faculty in making the regulations was not understood by all the fraternity students.

The regulations embodied the Faculty's best judgment as to the best method by which a well known and confessedly bad condition into which the fraternities had fallen, could be remedied. The Faculty knew that the rules would put the fraternities at a decided disadvantage for one year, unless they should adopt the policy of taking in upperclassmen, which did not seem probable. On the other hand, it felt reasonably sure that the passing of one year would relieve the burden, and the fraternities would be in a much better condition than before. Whether or not the Faculty was wise in these matters, is not now under discussion. It is the purpose and reasonable expectation of the Faculty at the time the action was taken that we are now presenting. It was unquestionably our earnest desire to retain the fraternities, and help them to maintain themselves on such a basis as would justify their retention and cut off reasonable and just criticism.

About the same time that the Faculty passed these regulations, the Pan-Hellenic Council passed additional rules and regulations, the exact nature of which need not be taken up. In their general effect they were supplemental to the Faculty regulations. As a consequence, at the opening of the present session, the fraternities found themselves under much larger

restraint than they had ever before been. Restrictions are always temporarily hindering, and if the one restrained is not in active sympathy with the restrictions, they are irksome; and if one is opposed to them, they almost necessarily produce irritation.

Notwithstanding these facts, from the investigation which the Committee had made, and some information already in its possession, it is gratified to report that the fraternities generally accepted the rules in good faith and intended to live up to them. The strength of this purpose we think varied in different fraternities, but on the whole the expectation and purpose of observance was good.

A number of the fraternities have houses which they have either bought or built largely on credit, and consequently there is considerable financial pressure from that source. Some of these houses are large; in a number of instances the fraternity men returning this session were few; so many, if not all, of the fraternities found themselves under financial pressure from the opening of the session. In some instances this lack of current funds was so great that alumni were called on for assistance. Under the closed season rule, no new first-year men could be taken in; so there was no help in that direction. However, some sort of "modus vivendi" was established by each fraternity. Almost all, if not all, of these plans contemplated the retention in the houses of all the men entering them at the opening of the session.

Time passed on and financial stress did not lessen. When mid-term reports or term examinations disclosed that different members of different fraternities were ineligible to remain in the houses, the financial problem was intensified. If the student left, either he must be at double expense for his board and lodging, or for lodging if he boarded outside, or the fraternity must lose the financial support which it had been receiving from him. Notwithstanding this, so far as your Committee ascertained, the "house rule" was kept by all the fraternities during the fall term, and by most of them until the mid-term reports in the winter term. In the meantime it was becoming manifest that the number of eligible freshmen was lessening after each

examination, and the source of supply for new members was becoming quite limited. The fraternity which did not get recruits would inevitably be in a worse condition next session than it had been this. This, in addition to the natural conditions of competition, made it exceedingly difficult to observe the non-rushing rule. It is impossible to say positively where common courtesy ends and rushing begins. Perhaps no two persons or fraternities would draw the line at exactly the same place. In this state of uncertainty, it is very difficult for any one to regulate his conduct so as to be entirely satisfactory to himself, and it is practically impossible for him to conduct himself so as to avoid the "appearance of evil" and avoid giving his rivals and competitors some ground for suspicion. This introduced a dangerous element into the situation. Near-rushing began, and it was but a little while till actual rushing became common, and before the beginning of the open season it had become intense.

This condition, though not directly in the line of our investigation, was brought out in so many ways and from so many sources that we feel justified in making the above statement.

The pressure against the "house rule" was getting heavier and heavier all along. The question would be presented differently in different cases. Sometimes it took the form of a construction of Rule 4 in two respects. First, what is moving out of the house; i. e., is getting a room at some other place and sleeping at such place and eating away from the fraternity, although the student spends all his working hours at the house or with his fraternity brethren, a compliance? Can a man pay elsewhere and sleep part of the time at the house and part of the time at his room, and if so, how is the time to be divided? A second difference of construction arises as to the right to re-enter. For example, a senior law student failing in not more than two subjects has a right of re-examination on the first week of the succeeding term. If he so fails and is thus ineligible but passes these subjects on his re-examinations, is his eligibility restored? This arose in two cases, and a different but similar question as to restoration to house privileges arose on quiz grades. Sometimes the matter took the form of neglect on the part of the ineligible students; sometimes the form of

refusal by such student to move, and other cases presented other phases. Members of one fraternity would see supposed ineligibles about their respective fraternity houses, and each would embolden the other. All of these matters helped to obscure the situation.

Under these conditions all of the fraternities, as we are led to believe, violated the rushing rules. Eight of them so far as shown by Dr. Parlin's preliminary investigation kept the house rules. As to these we made no investigation. We did make a fairly full investigation of the eight which were under suspicion. The result in each case we give below, with our conclusions. These run all the way from compliance with the rule as interpreted by the fraternity involved, or its representative, to conscious failure to enforce the requirement.

We wish to repeat that in every instance the students were entirely candid, and there was no indication of affirmative rebellious attitude by any of them. In each case the Committee dealt with the facts as presented, and admonished the representatives in such manner as it thought just under the circumstances. In some instances where the question was one of construction, little admonition seemed needed. In others, the situation was more grave and was treated accordingly.

The foregoing facts impress your Committee with the thought that some change of conditions for the future should be made and also that some punishment should be imposed for the violating of the rules which have already taken place.

Considering the punishment first, three phases come up: should the punishment be directed toward (1) the group, (2) the student representative, or (3) the particular students who refused or failed to move, or toward two or more of these? Your Committee believes that punishment should embrace all these. The degrees of culpability as among these vary in the different fraternities. In some cases, it is not at all probable that the fraternity as such knew of the ineligibility of the individual student or of disregard to rules by him. In others, there is good reason to believe that the whole matter was known to and discussed by the fraternity and the action was acquiesced in by the group.

As to representatives, the Committee thinks that probably, in most, if not all, instances, real good was accomplished by their interviews with the Committee and the admonition given by it.

As to the delinquent students, the work of the Committee was not equally effective: first, because frequently these persons were not before the Committee; and second, in some of the cases in which they were, the results reached did not seem to be as good. These matters will be discussed further in regard to each fraternity.

The punishment which seems most applicable to the group seems to the Committee to be some form of publicity. This could be of several kinds. First, a publication of the facts among all the fraternities here. This is hardly desirable, (1) because in a general way the facts are pretty well known among the different fraternities, (2) because of the above fact it would be rather furnishing evidence to each fraternity against every other one than subjecting any fraternity to the humiliation of bringing facts to the knowledge of persons really ignorant concerning the transactions. Second, a report of the facts regarding each fraternity to the national body of such fraternity. We think that this, if done in a proper way, would be of great benefit. The best way in which this could be accomplished would be by the action of each fraternity sending on its correct report. This the Committee would highly recommend. It was in large matter to facilitate this that the Committee proposed the general features of this report. If the fraternity does not do so, the Committee on Social Organizations should forward the information. Third, the facts could be made known to the General Faculty. Under some circumstances this would be quite desirable. The situation is one which seriously involves the interests of the University. The time remaining in this session is so short and the Faculty scatters so soon after Commencement, that it may not be practical to give this information this session.

In view of the closeness of the end of the session, the Committee recommends: that a copy of this report in its general features be furnished at once to each fraternity, and that in each instance the general features be supplemented with the conclusions of the Committee as to the particular fraternity to which

the copy is sent; that no copy of the findings as to any fraternity be furnished to any other fraternity: that each fraternity be requested to notify Dr. Parlin within ten days of its receipt of the copy of the report whether or not it has forwarded a copy to its national body, and each fraternity be entirely free to give to the report in its general features, and so much of it as particularly refers to it, such publicity as it desires.

If there is sufficient time before the end of the term to do it properly, the Committee suggests that the senior representatives of all the fraternities and such other members of the several fraternities as shall be designated by them respectively be called to meet with the President, the Discipline Committee, and the Committee on Social Organizations, for the purpose of discussing the whole fraternity situation. If this cannot be done this year, it might be done at the opening of next year. This meeting would accomplish several very desirable results: first, it would bring about a better general understanding between the fraternities and these representatives of the Faculty; second, it would unify the meaning and application of the rules adopted by the Faculty, an interpretation of which is much needed; third, it would emphasize the attitude of the Faculty toward the fraternities, and show the absolute necessity of good faith between the Faculty and the fraternities.

Passing to the facts as to the particular fraternities. The Committee believes that all fraternities violated the rushing and pledging rules to a greater or less degree, and that if there are any differences in their culpability in these respects, the Committee has not developed them. It is only fair to say that representatives or members from only eight fraternities have been before the Committee, but it seems to be the universal opinion that there was but little difference in the conduct of all.

As to the violation of the house rules, the eight fraternities investigated divide into at least two groups: first, those who base their conduct mainly on a construction of the rules consistent with their actions; second, those whose conduct cannot be justified by construction of rules, but must depend on the facts and the intent in each case. In the first group fall the Phi Delta Theta, Sigma Chi, Kappa Alpha, and Chi Phi. In the second

group fall the Beta Theta Pi, Kappa Sigma, Sigma Alpha Epsilon, and Phi Gamma Delta.

REPORT OF COMMITTEE ON SOCIAL ORGANIZATIONS ON VIOLATIONS OF THE PLEDGING RULE, SESSION OF 1913-1914.

(See above, p. 13.)

The Committee on Student Social Organizations was unable to determine from its examination of those concerned in the rushing of Miss ——— that the Pi Beta Phi sorority had extended an invitation to Miss ——— before the appointed time for pledging, or that this fraternity had exacted any promise from Miss ——— that she would join the Pi Beta Phi Sorority. The Committee, therefore, does not find the Pi Beta Phi sorority officially guilty of a breach of the Faculty rules. In this connection the Committee would emphasize the fact that the seeking on the part of sororities for information in regard to the inclination of rushees was not confined to the two sororities concerned in the special case before the Committee.

The Committee, however, found (1) that one member of the Pi Beta Phi sorority who is now a student living in the chapter house was indiscreet in seeking to obtain information as to the inclinations of the rushee in question prior to date for pledging; (2) that one alumna member living in the chapter house was unduly active in seeking to find out the exact inclinations of the rushee; (3) that an alumna member living out of the house, together with her mother, may be said to have violated the spirit of the Faculty regulation, if not the letter, in her various conversations with Miss ——— in regard to the Pi Beta Phi sorority, an activity on the part of those outside the University that should be discouraged by the sororities; (4) that the sorority that brought the complaint against the Pi Beta Phi itself overstepped the limits in regard to the pledging rule when several of its members argued at length with the rushee on the advisability of her joining their sorority. This occurred on Saturday afternoon and evening, May 16, after the alleged pledging to the Pi Beta Phis had become known.

While the Faculty regulations are not concerned with rushing, and the Committee has no jurisdiction over this activity, the

Committee believes that rushing which goes so far as to attempt to determine the inclinations of the rushee in regard to any fraternity is dangerously near a violation of the Faculty regulation in regard to pledging, and that such activity is undersirable and should be avoided.

(Signed) H. T. Parlin,
Chairman of the Committee.

Report of Dean Benedict on Violation of the Initiation Rule, Session of 1916-1917. (See above, p. 22.)

March 1, 1917.

President R. E. Vinson, University of Texas.

Dear Sir: In response to the enclosed letter from the Chairman of the Committee on Student Social Organizations, the Discipline Committee at your request, on February 26, had Mr. —— and Mr. ——, Corresponding Secretary, and Mr. ——, President of the local Phi Gamma Delta Fraternity, before it for a hearing. These gentlemen were frank in their replies, and the Discipline Committee had but little trouble in coming to what it believes to be the facts in the case.

(1) Mr. ——— went to Lawrence, Kansas, during the Christmas holidays and was there initiated into the Kansas Chapter of the Phi Gamma Delta without being a matriculate of Kansas University. Mr. —— regularly registered in the University of Texas in October, and has since remained a regular matriculate. According to Paragraph One of the University of Texas "Regulations Affecting Social Groups," Mr. —— was not eligible to be initiated into a fraternity during this long session.

(2) Mr. ——, Corresponding Secretary of the local Phi Gamma Delta, before Mr. ——'s initiation at Lawrence, wrote twice to Kansas Chapter endorsing Mr. ——— for initiation and describing himself as Corresponding Secretary.

(3) The local Phi Gamma Delta chapter had not recommended to the Kansas Chapter the initiation of Mr. ——, and some at least of its members did not know about the initiation until after its occurrence.

The Discipline Committee therefore recommends that:

(1) Mr. —— and Mr. —— be suspended for the rest of the long session for conspiring together to circumvent and for circumventing Paragraph One of the "Regulations Affecting Social Organizations."

(2) The local Phi Gamma Delta chapter be held blameless in regard to this initiation.

(3) The Committee on Social Organizations communicate with the national officers of the Phi Gamma Delta fraternity to determine the attitude of that organization in this and similar matters.

(4) The President of the University of Kansas be informed fully in regard to this occurrence.

The Discipline Committee begs leave to emphasize, in conclusion, the importance of this case, which creates a precedent. If a student, by merely taking a trip, can evade the fraternity regulations, these regulations at once fall to the ground.

Very sincerely yours,

H. Y. Benedict.

APPENDIX VI.

PETITION PRESENTED TO THE GENERAL FACULTY, FEBRUARY 9, 1915. (See above, p. 18.)

To the President and Faculty of the University of Texas:

We have again presented our demands for abolition of fraternities and sororities to the Legislature, and this body has again decided by the narrow vote of 68 to 59 that the Faculty is the proper body to take this action.

After two years' trial of regulation, we again submit to you this petition to abolish fraternities and sororities from the University. We submit that the case against fraternities and sororities as presented to your Committee two years since is still true in all essential particulars; that the evil has not diminished; and that the only cure for the evil is abolition of a system which, in your own words, tends "to exaggerate social distinctions artificially," a system which, we believe, has no place in a democratic institution supported by public taxation.

We deprecate the need of continued agitation of this question. But we are mindful of the fact that no reform can be effected without agitation. It has been charged that by agitation of this question we are affecting the popular support of the University, and hence are disloyal to the Institution. We answer that those opposing abolition of fraternities and sororities are quite as disloyal as we. Again, we are charged with encouraging the idea that this is a "rich man's school," but if such opinion has gone out over the State, we maintain that it is not due to any action on the part of the barbs, but rather to the action of a small minority of the students in the fraternities and sororities, whose surroundings and environment encourage extravagance and a spirit of exclusiveness. It is a democratic University, but we deny that any spirit of democracy can be traced to the fraternities. If this school can be made more democratic, it should be so made. Our very government is founded on democratic principles. If there are any institutions in our midst that create an atmosphere that is not wholesome to these principles, we say that such institutions are

undesirable, and should be eradicated. By your own findings, "fraternities have tended to exaggerate social distinctions artificially in that they are guilty of an assumption of superiority, often not well founded." These are serious findings, and a register of facts and conditions within themselves detrimental to any public institution; and you, as well as we, lay the cause of this, not so much at the feet of the men and women within these institutions, as to the *system* of fraternities and sororities.

We have been called a few disgruntled students, but we leave you to judge whether or not a majority of the students of the University are a "few disgruntled students." Some say that we are in this fight for political purposes, but we will remind you of the fact that we have nothing to gain politically. We have practically every student office of importance at the present time. If we were seeking selfish political ends, it would pay us to leave the system as it is at present. We realize that this constant division of the student body is not best for the University. It is not best for student self-government. It is not best for student activities. It is this that we are seeking to eradicate from student life. We want to eliminate this cause of dissention from our student body. We want to see student politics in such condition that men will be selected for what they are, and not because they are barb or frat. Some say that such strife is wholesome to student politics, but we believe that any system which creates a line of cleavage in the student body, preventing the consideration of men or measures upon their merits, is not for the University's best interests. Such system has kept us from getting our best men in office. It has kept us from uniting on great questions which are for the best interests of the University. The fraternity question keeps the student body divided into two hostile camps. This is one of the greatest results for evil that they bring about. It is embodied in your findings. If it has changed since you made your findings, we have failed to detect the change.

The barb-frat issue is becoming of more importance every day. It has at last entered State politics. If within the next two years it makes the growth that it has for the last two, it

will be a political issue for our legislators. We know that the University should not be dragged into State politics unnecessarily. But if we are right, we maintain that we should fight the wrong to an end.

It is reported that you are afraid that abolition of the fraternities would injure the support of the University. Seventy-five per cent. of the old students are non-fraternity men. The leading members of the Legislature are with us, and oppose fraternities. The fourteen members present and not voting on the bill for abolition were with us, but hesitated to take such matters out of your hands. A majority of the members who voted against the bill are with us in principle, but hesitated for the same reason. However, some of these very men who voted against the bill have invited us back two years from now, if there should be any necessity for going back. One fraternity member of the House, while opposing the bill, expressed himself as hoping the bill would carry. A number of fraternity men refuse to let their sons join fraternities; hence they would not object to abolition. The majority of the others are loyal to the University, we hope. If they are not, the old barbs, the present barbs, the future students, and the good people back home, the source of all revenue, who are overwhelmingly with us, will make this University what it should be,—the greatest in the South, and one of the foremost in the Nation.

Two years ago you said:

"It is the unanimous opinion that a fair trial of the Faculty regulations should be made for two years; if at the end of this period of probation, impartial investigation should find that the system is still a source of serious grievance, it is our united and emphatic recommendation that more drastic action than is now proposed should be taken."

At the end of this period the system is still "a source of serious grievance," and we submit that the time is at hand for the "more drastic action." You have tried regulation; *regulation has failed.* In fighting an evil, the thing to be done should be kept clearly in mind.

The thing to be done is to eliminate these artificial, exaggerated social distinctions of which your report speaks. Regulation will correct only some of the external things that have gone along with the system, but regulation does not strike the system itself; and the system itself, not its petty corollaries, is what we want done away with.

It is said that greater evils in the form of social clubs will follow the abolition of fraternities and sororities. Who raises this cry? Not the non-fraternity students, who comprise fully three-fourths of the student body. And if three-fourths of the students can exist without social clubs, their example and influence should be able to assist the remaining one-fourth of tne students to get along without creating a serious social club problem. Further, it is a far cry from such institutions as Harvard and Princeton to the University of Texas. Conditions and environments here are very different. In any event, so far as this feared social club evil is concerned, "sufficient unto the day is the evil thereof." Will the Faculty decline to eradicate an existing evil because fraternity men argue that other evils will result? And is the Faculty willing to admit that it is unable to deal with student organizations?

Respectfully submitted,

(Signed)

W. B. Bates.
C. F. Richards.
R. M. Wagstaff.
Joseph H. Byers.
R. L. Bobbitt.
Sam Holliday.
George W. Anderson.
Francis J. Lyons.
Meade F. Griffin.
Walter R. Linn.
H. J. Casey.
H. J. Voorhies.
Tom Cheatham.
P. H. Powell.
O. B. McPherson.
Joe Sherrill.
A. G. Dawson.
M. Oates.
E. D. Smith.
John A. Storey.
W. H. Dodson.
E. G. Hillman.
Guy Rogers.
Hines H. Baker.
Oscar Speed.
W. H. Griffin.
J. B. Ferguson.
J. H. Goodman.
W. B. Powell.
Ira A. Hunt.
L. H. Flewellen.
D. E. Mulcahy.
T. W. Anderson, Jr.
Geo. E. B. Peddy.
Rex G. Baker.
Herbert Hedick.
Roger A. Burgess.
W. W. Hawkins.
S. B. Garrett.

Elizabeth Butts.
Henry Lee Taylor.
Selma Street.
Pauline Wherry.
C. H. Clark.
P. M. Kenley.
S. G. Baggett.
Reece Meador.
J. H. Hinds.
J. R. Nicholson.
Bryant Seay.
J. F. Robison.
O. W. Fannin.
S. W. Crossley.
M. D. Wallace.
W. C. Reed.

APPENDIX VII.

Fraternities and Sororities at the University of Texas.

(With the dates of their establishment at the University.)

Phi Delta Theta, September 15, 1883.
Kappa Alpha, October 5, 1883.
Beta Theta Pi, November 22, 1883.
Phi Gamma Delta, December 12, 1883.
Sigma Alpha Epsilon, May 27, 1884.
Sigma Chi, August 27, 1884.
Kappa Sigma, September 18, 1884.
Sigma Nu, December 1, 1886.
Chi Phi, March 19, 1892.
Alpha Tau Omega, May 1, 1897.
Delta Tau Delta, April 4, 1904.
Phi Kappa Psi, October 27, 1904.
Delta Chi, April 13, 1907.
Delta Sigma Phi, May 15, 1907.
Theta Xi, February 22, 1913.
Delta Kappa Epsilon, March 2, 1913.
Acacia, April 6, 1916.
Lambda Chi Alpha, May 14, 1917.

Pi Beta Phi, February 19, 1902.
Kappa Kappa Gamma, May 12, 1902.
Chi Omega, May 31, 1904.
Kappa Alpha Theta, September 18, 1904.
Zeta Tau Alpha, May 7, 1906.
Alpha Delta Pi, June 7, 1906.
Delta Delta Delta, February 22, 1912.
Phi Mu, May 15, 1913.

APPENDIX VIII.

Method of Computing Scholarship Averages.

In putting into operation the requirements of the Faculty regulations governing social groups among the students, it is necessary to compute the general scholarship average of the University and the individual averages of the individual social clubs or fraternities. The general University average and the individual group averages are subject to the same method and conditions in the computation of such averages.

General conditions governing the computation of scholarship averages:

I. The count will be made for the long session. In the general average, all students who have at the opening of the session four courses to their credit will be counted.

II. The fraternity averages will be based upon the official rolls of the chapters filed with the chairman of the Committee in charge of the regulations.

III. All students carrying two courses or less will not be counted.

IV. All students over 25 years of age and carrying less than four courses will not be counted.

V. Credit made by advanced standing examinations will not be counted.

Correspondence credits will be counted only in the case of work begun and finished in one long session.

Students who have postponed examinations will be counted that fraction of a student determined by the ratio of the number of hours per week completed and recorded to the number of hours per week for which such students are registered.

VI. Graduate students in the College of Arts will not be counted.

VII. Students carrying more than six hours and less than fifteen hours per week in any term, and carrying all the work necessary for graduation, will be counted that fraction of a student determined by the ratio of the number of hours per week carried to fifteen hours.

VIII. Each chapter will be allowed for casualities due to sickness, death in the family, financial distress, etc., a reasonable elimination from its rolls, excuses from the count to be approved by the chairman of the Committee. The total percentage of such elimination in the fraternity group as a whole will be made also in the University group as a whole.

IX. Members of fraternities transferred from other colleges will be counted, unless the Committee is officially notified that they have not been affiliated by the local chapter of the fraternity to which such transfers belong.

X. The qualitative factor (grades made), in the final averages, will be reduced to the quantitative unit (number of courses passed) by a scheme of premiums. The letters used in grading are evaluated thus: A=95; B=85; C=75; D=65. To the actual number of courses passed by any group the following additions will be made: 10/65 on C; 20/65 on B; and 30/65 on A.

Fraternities	Charter granted	Membership			Scholarship		
		1914–1915	1915–1916	1916–1917	1914–1915	1915–1916	1916–1917
Acacia	1916	.....	24	22	.....	6.40	6.47
Alpha Tau Omega	1897	16	19	20	5.10	6.62	7.16
Beta Theta Pi	1884	14	17	23	6.74	6.76	6.95
Chi Phi	1892	7	6	23	5.00	5.88	6.15
Delta Chi	1907	18	19	30	6.04	6.97	7.03
Delta Kappa Epsilon	1913	17	19	26	5.99	7.21	6.87
Delta Sigma Phi	1907	12	13	18	5.05	7.18	5.64
Delta Tau Delta	1904	29	20	32	6.35	6.26	6.21
Delta Theta Phi	1916	.....	.....	31	.....	.....	5.94
Kappa Alpha	1883	25	22	23	5.05	6.19	6.50
Kappa Sigma	1884	18	15	21	5.14	6.67	5.68
Lambda Chi Alpha	1917	.....	.....	10	.....	.....	5.55
Phi Delta Theta	1883	30	31	33	6.35	6.89	7.26
Phi Gamma Delta	1883	18	19	31	5.19	5.90	6.01
Phi Kappa Psi	1904	15	17	25	5.72	6.30	5.84
Sigma Alpha Epsilon	1884	20	29	31	6.48	6.29	6.47
Sigma Chi	1884	12	18	21	6.23	6.28	6.37
Sigma Nu	1886	16	16	22	6.15	5.67	5.78
Theta Xi	1913	19	17	24	5.37	6.11	5.56

Sororities	Charter granted	Membership			Scholarship		
		1914–1915	1915–1916	1916–1917	1914–1915	1915–1916	1916–1917
Alpha Delta Pi	1906	24	26	30	5.75	6.24	5.90
Chi Omega	1904	21	25	26	5.96	6.01	6.62
Delta Delta Delta	1912	23	23	21	6.05	6.15	5.98
Kappa Alpha Theta	1904	18	16	22	5.59	5.86	7.11
Kappa Kappa Gamma	1902	22	30	27	5.08	6.41	6.91
Phi Mu	1913	17	12	14	5.52	6.11	6.27
Pi Beta Phi	1902	16	19	26	5.87	6.40	6.21
Zeta Tau Alpha	1906	20	22	26	5.84	6.26	6.11

B146-917-10m

University of Texas Bulletin

DEPARTMENT OF EXTENSION

No. 1739: July 10, 1917

How a Superintendent May Aid His Teachers In Self-Improvement

BY

Leroy Walter Sackett, Ph. D.
University of Texas

AND

Elzy Dee Jennings, M. A.
Texas Woman's College, Fort Worth

Published by the University six times a month and entered as second-class matter at the postoffice at AUSTIN, TEXAS

The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston

Cultivated mind is the guardian genius of democracy. . . . It is the only dictator that freemen acknowledge and the only security that freemen desire.

President Mirabeau B. Lamar.

HOW A SUPERINTENDENT MAY AID HIS TEACHERS IN SELF-IMPROVEMENT

(Presented in something near its present form to the County Superintendents Institute, Austin, Texas, July 25, 1917.)

Introduction

The preparation of this small bulletin has been inspired by a distinct desire to aid the busy County Superintendent in a very concrete way in directing the improvement of his teachers and their schools. The writers feel that they know the problem both from its practical side through wide experience and from its scientific side through extended studies into what the world has thought and said on the question. In many regards there are no absolute standards of perfection and choice must be made among many excellent suggestions. In the opinion of some, no doubt, the best has not been set forth. When an ambitious but somewhat untrained superintendent goes into schools of modest equipment manned by teachers who often have had only a limited experience and a small amount of professional training, the possibility of realizing concrete ideals is limited.

Few people appreciate the difficulties of a country school teacher and fewer still the dangers she encounters. Even teachers themselves many times do not realize that there are so many things inherent in the profession which make for the degeneration of their own minds.*

Paradoxical as it may seem, the act of teaching and developing the minds of others is found to be detrimental to the growth of the teacher's own mental powers. Many teachers may realize this vaguely in that sense of longing or hunger for comparison with others, for knowledge of just how they are getting along and just where the weak places are in their work. Other people may see it even more clearly when the teacher has settled into a rut of self-complacency looking upon all pro-

*Sackett, L. W., Professional Retardation: The factors inherent in the teaching profession which makes for mental retardation. Amer. Sch. Board Jr. June 1915.

posed changes of matter or method as fads of uncircumcised trouble makers. The old prayer of Robert Burns about seeing ourselves as others see us is partly answered in these pages and by the plan here proposed. The success of the plan depends upon at least two things:

First, the courage of the visiting superintendent to check in a friendly and unbiased way a true picture of things as he sees them.

Second, upon the willingness of the teacher in charge to accept the judgment at its face value and to study the scoring to find her own weak points and her most urgent lines of improvement.

As to the first, the County Superintendent must realize that among the numerous details of running his office there rises one very prominent peak of obligation,—that of being the professional expert of his county. It is his chief duty and should be his greatest study. Out of the maze of financial, attendance, and other administrative details he must rise to establish ideals of educational method and to safeguard hygienic conditions of school pupils. Despite the fact that his is a political office he must stand ready to approve excellence and criticise inferiority with equal candor. The little children of Texas' schools demand it of him, and have none other to whom they can appeal. He should resign at once if he has not the courage to tell a certain teacher that she scores lowest in the county or a school board that its plant ranks 56th in a graded series of 60 schools in the county, when these are found to be the facts.

The second condition would need no comment or elaboration if it were not that those teachers who need most greviously such a professional auditing will be least willing to accept the verdict gracefully and without unwarranted boasting or resentment. Possibly no more hopeless situation exists in the modern school systems than that of the experienced teacher with a poor method entrenched in the rural school system and unwilling to study for self improvement. Until such teacher dies, or resigns, or is dismissed, or can be peacefully chloroformed with a professional pension, there is little hope of relief.

Fortunately there are not many such and it is firmly believed

that rural teachers are anxious to have definite guidance in their own improvement and that they will welcome such a tangible plan as the one discussed below when it is administered in their interest and not as a means of dignified fault finding.

THE PLAN

The plan here proposed should be carried out in the following steps, its greatest effectiveness depending upon the care with which each part of the process is executed.

1. It is essential, first of all, that the superintendent study the schedules in the appendix and the description of the several items therein contained. He should adjust his ideals of school conditions to those set forth in the bulletin or clearly state on an insert just wherein they differ. The important thing, in addition to having high ideals of school work and equipment, is that the teacher may be made aware of just what those ideals are and the exact points upon which she is being graded. This constitutes the Superintendent's preliminary preparation before he goes out to visit the schools and before he begins to pass judgment upon the conditions found. It means hours and days of hard work but is no more than the preparation he has the right to expect of those whom he is supervising. A few days preliminary practice with schools outside his jurisdiction is strongly urged. It will be time and money well spent.

2. The second step is for the Superintendent to carry the bulletin into the school room and there begin the grading of the teacher and general school environment as described in the first schedule on "Efficiency of Teaching." Carbon paper should be used so as to make duplicates. The plan recommended is to take each of the ten items separately checking the position of the teacher on that as a scale of excellence. A teacher will probably be high in some and lower in others. Rarely will one be found "Excellent" in all or "very poor" in all. Each degree of excellence is indicated by the number at the head of the column. If decision can not be made as to just where to place the teacher, the mark may be placed between two of the steps and its value indicated by an odd rather than

an even digit. For example on "The room," the condition of the air may have a faint trace of stuffiness but otherwise the room may be neat and well arranged. This might be checked between "good-fair" and "fair-poor" and take the score "7." By "neat and well arranged" the Superintendent must understand as consistent with good working conditions. Even after recording the judgment of each of the rubrics, there should be no hesitation in changing the judgment concerning any point if later observation seems to indicate that first impression resulted in too high or too low grading on that item. The sum of the grades of the ten items will be the grade on a percentage basis of the teacher's efficiency. No standard grades can be given. Each Superintendent must establish standards for himself. With a similar method, Jennings found in his Dallas School Survey that the teacher who graded above 90 per cent might be considered "Excellent" in general efficiency. Those whose grade was below 70 per cent were only fair bordering on inefficiency. Even this latter group need not be eliminated or even admonished or reprimanded. They may need encouragement and just the assistance which this bulletin and plan is designed to give. If on later examination there is no apparent effort towards improvement more drastic action may be considered.

In like manner the school plant may be graded on the twenty-five items listed and this time on each of the four points under each item, as to whether or not it is present or absent. There are one hundred points listed. Each counts one point if it is there. The Score is the Sum of the points checked as being present. Probably no school will have a perfect record. A few will score high, a few very low, but a majority will fall in the median position. In this also the Superintendent should use the greatest care and fairness. If the thing is there but in a somewhat unsatisfactory condition it may be scored one-half point. The whole object must be to reward efforts which have been made in the past and to stimulate further effort towards improving school conditions.

3. The Superintendent then after entering the name of the teacher, the school and the date should tear out the originals of

the two schedules for his own office files leaving the carbons attached. The bulletin so marked and labeled should be handed to the teacher with whatever other words of encouragement or criticism the Superintendent may feel like giving. A word directed to the items in the schedules needing adjustment should be given in such a way as to leave no doubt in the mind of the teacher that his only motive is to help and to direct in her own improvement, rather than to find fault with her efforts.

4. The next step is made by the teacher who should study the whole plan and her own shortcomings in the light of the ideal conditions set forth in the paragraphs describing the schedules. Here is where the teacher gets the answer to her "Bobbie Burns" prayer. No one need admonish the teacher to do this. She will reread it many times and it will begin to show in her daily work. Not many weeks will pass till she will be wanting the Superintendent to come again and see how she has improved conditions. It gives here, for the first time, an insight into the conditions upon which she is being judged. It is fair to her and she will respond to it. Many a teacher has "failed" and been dismissed without ever being told either before or afterwards the reasons why her work was unsatisfactory. The greatest astonishment probably will be for the teacher to discover that some of her highest ideals of teaching, those she has rested upon in serene satisfaction, are being marked "fair" or "poor." If she takes it as a matter of persecution by a superintendent who "thinks he knows it all" there is little hope for her improvement. Few will take that attitude. Most are hungry for definite, tangible lines of improvement and they will strive for better success. The teacher may even grade herself from day to day on the same score cards used by the Superintendent. Her progress will depend upon the thoughful integrity she exercises in this little game of pedagogical solitaire. She should not be over-indulgent with herself nor should she provoke a disturbing professional conscience.

5. The next step should be for the teacher to tear out the schedule of "Teaching Efficiency," which is personally and confidentially her own and give the bulletin with the marked

schedule of the "School Plant" to the chairman of the local school board. Again the bulletin will be read by the board members with intimate interest, and no doubt will become a part of their permanent record to figure in the next board meeting and in the next annual budget.

6. When the year's visitation is done and reports from all schools are on file, a secretary in the Superintendent's office should figure the ranking of each teacher and each school. A special letter should be sent to each teacher telling her her rank among the teachers of the county. Another to each school board should tell them the rank of their School Plant and of their whole school in general all things considered. A school board should be told their true status in relation to the other schools of the county. If they are superior let them enjoy the satisfaction of their supremacy. If they belong in the lowest 10 per cent, special pressure should be brought to bear and probably will be if the community is apprised of the facts.

No attempt should be made to compare schools in different counties as the standards of grading of two superintendents might be so much at variance as to render results incomparable. This is especially true concerning the schedule on Efficiency of Teaching. It is not to be supposed that the variation of the Superintendent's judgment from day to day will materially affect the figures for the comparison within the county though this should be guarded against.

7. The last step in the recommendations of this plan is for the County Superintendent to use the same schedule again next year carrying with him the old markings and after checking up the school again in the original way make comparisons, noting improvements and finding the reasons why certain other things have not yet been brought up to standard. A few years of this careful work will show lines of improvement which might not be attained in decades of the general desultory directions and admonitions.

The question of the school survey is but one aspect of the general propaganda of efficiency which has done so much in the economic world to eliminate waste and bring industrial plants to their highest productiveness. It is beyond the experimental

stage. It appeals to the business integrity of business men on school boards. The plan here outlined embraces but a few phases of what a survey ought to involve. The object is more to stimulate self-improvement than to tabulate conditions for statistical purposes. When this abbreviated form has demonstrated its effectiveness the authors will be ready to make further suggestions.

Interpretation of "Schedule A" on Efficiency of Instruction*

Note: "Fair" is most often found and is used to begin each observation with varying grades towards excellent and poor.

1. *The Room.* The degree of "stuffiness" of the air should be observed upon entering and upon leaving the room. If noticeable at all mark not above "Fair"; if not noticeable mark "Good"; if invigorating mark "Excellent"; if depressing mark "Poor." Mark "Fair" if the room is bare but neat; "Good" if neat with well ordered furniture and decorations; "Marked" if all things are unusually attractive on account of skill in the selection of colors, pot plants, etc.; "Poor" if bare and littered; "Lacking" if bare, littered, dark and uncomfortable.

The freshness or foulness of the air of a room is only noticeable when one enters the room and detects the "stuffy" sensation or when one steps out and notices the extreme invigorating character of outside air. It can not readily be noticed while one is within for any great length of time. In like manner the neatness, cleanliness and decorations in the way of pictures, pot plants, etc., would influence the scoring. The latter in particular must be judged as to color selection, artistic arrangement and appropriateness. Exceptional skill may be difficult to standarize but not so difficult to appreciate. Lack of taste is shown when neatness and cleanliness are neglected

*"Schedule A" and the specific directions for using were taken from Mr. E. D. Jenning's "Report to the Dallas School Board on the Teaching of Mathematics and English in the Elementary Schools, 1915."

and when decoration is either neglected, or badly done, or over-done.

2. *The Teacher.* Mark "Fair" if the teacher is of fair health, comely, neat of dress and has a clear voice; "Good," if of good health, beautiful, dignified, neatly dressed, and has a clear and pleasing voice: "Excellent" if with all the above is vigorous, poised, quiet, systematic, and with a voice of the proper pitch; "Poor" if of poor health, homely, slovenly dressed, irritable, and with a harsh or indistinct voice.

Remember that every person may be beautiful or homely in their own way. The question is not one of conformity to any classic models but of how well the teacher realizes her own possibilities of personal attractiveness. Likewise there are no standards for health. The teacher who is vigorously well is "excellent." The one who is just not sick is "fair." The wan or sallow complected must be marked "poor." Care in dress also marks a good teacher as much as her ability to conduct a recitation.

3. *Companionship.* Mark "Fair" if three of the following attributes are present in both teacher and pupils: friendly, sympathetic, co-operative, tolerant, courteous. Mark "Good" if four are present; "Excellent" for five; "Poor" for two; "Wanting" for only one. Nothing is really gained by the teacher who maintains a cold aloofness towards her pupils. Observe the general atmosphere and not just the relation to a few pupils. The five terms noted are not exclusive in their connotation but represent prominent characteristics. None of them exclude the element "firmness" as they are often thought to do nor do they in any way endanger ultimate authority in discipline. They may even prevent the strained relations which make discipline necessary. Note that all, with the possible exception of "tolerance" must be present in teacher and pupils if present at all.

4. *Discipline.* Mark "Fair" if the teacher succeeds in correcting any misconduct; "Good" if no misconduct occurs; "Excellent" if pupils show any initiative in keeping proper order;

"Poor" if teacher fails in effort to correct misconduct; "Wanting" if misconduct is continually occurring without the teacher taking notice. That control of a school is best which is accomplished without the teacher having occasion to caution or correct. It is poor in two extremes, viz.: first, where the teacher reigns supreme as a feared overlord; second, where the children are forming habits of disorder with the teacher not seeing it, or taking an ineffective attitude in reference to it. Records show that teachers fail in this more than for any other cause; also that abiding impressions for character and ambition are here made more frequently than in the teaching of school subjects.

5. *Study Classes.* Mark "Fair" if the pupils not reciting seem busy; "Good" if the teacher gives them any systematic directions; "Excellent" if the systematic directions lead the pupil to put forth his own efforts; "Poor" if the unity of the class reciting is permitted to be broken by individuals in the class studying; "Wanting" if students are permitted to be idle when not in the class reciting. Do not mistake interest in and attention to the reciting class for idleness. It may be the best schooling the pupils will ever have to listen to the other class reciting. Consistent with the mastery of his own lessons this is not only allowable but desirable. Much of the excellence of this phase of the teacher's success depends upon her skill in carrying out the next item.

6. *Assignment.* Mark "Fair" if made clear and distinct without comment. "Good" if it is given its proper connection with the lesson preceding; "Excellent" if curiosity is aroused in the pupil's mind that will lead him to study the new lesson with interest; "Poor" if merely assigned by pages. The proper time for assignment of the next day's work is at the beginning rather than at the close of the recitation period. Then one is not hurried and the pupils have a chance to see today's work in relation to both the past efforts and future aims. It furthermore sets the aim of the present recitation. Without adequate assignment pupils waste time and can get no system in their work. With proper assignments they have interest and

know how to satisfy that and meet the requirements of the next day.

7. *Method.* Mark "Fair" if the movement of the pupils seems slow and the directions of the teacher indefinite or confusing; "Good" if the class recitation moves through without serious delays; "Excellent" if everything moves through properly with no unnecessary talking and ill-adapted devices; "Poor" if the teacher talks too much and uses poorly adapted devices; "Wanting" if the teacher fails to get responses. No commercial business could be run with profit with the loss of time and energy found in most school rooms. The teacher should actually time herself in getting started after recess, in sending a class to the black-board, etc., remembering that four minutes lost by thirty pupils is equivalent to a total loss of two hours time. Here is where drill in the routine phases becomes important.

8. *Knowledge.* Mark "Fair" if pupils seem to be getting only a fair understanding of the lesson. "Good" if they respond readily to thoughtful questions; "Excellent" if they discuss logically the subject-matter; "Poor" if rote memory only is partially aroused by leading questions; "Wanting" if the teacher fails to get responses. The teacher's knowledge is supposed to be adequate before she enters the school. The test is not whether she is displaying and repeating valuable information but whether the children are being mentally awakened and developed. One should really not teach geography, history, etc. but should use these subjects to teach and train children. Success is measured by their action rather than by the teacher's action.

9. *Appreciation.* Mark "Fair" if the students assume the silent attitude of attention most of the time; "Good" if they ask eager questions, or show a desire to do so; "Excellent" if they volunteer appreciative expressions or show them in their faces; "Poor" if they seem indifferent; "Wanting" if they seem bored or disgusted. This is less tangible but no less important. Even drill in the multiplication table may portray expression. In this the teacher is judged by the pupils' atti-

tude, whereas in the above she was judged by the pupils' accomplishment. Success in this keeps children in school longer and makes each unit of time more valuable.

10. *Results.* Mark "Fair" if the pupils show a fair ability to apply the principle of the lesson in writing, reading, figuring, or speaking; "Good" if they are quick to respond in review, etc.; "Excellent" if they show any permanent effect upon habits of thought and action; "Poor" if they show immediate forgetfulness; "Wanting" if they seem unable to profit in any way by former teaching. Results observed here are not those revealed in the examination papers but those evident from day to day in the general conduct of the child on playground, at study, and in class.

INTERPRETATION OF "SCHEDULE B" ON THE SCHOOL PLANT

GENERAL EXPLANATION: The following is a brief interpretation of the points to be considered in judging a school plant. In the scheme there are 25 rubrics each of which has 4 subdivisions with each of such divisions considered worth 1 per cent. These may be checked "1," "½," "¼," etc., according to the conditions found in the survey. No attempt has been made to determine or estimate the relative importance of the different items. That is, no one knows whether it is more important to have a well drained yard or a well equipped laboratory. All are considered equaly important. The total will be the score of the school plant, on the basis of one hundred per cent. Some of these, of course, the teacher is not responsible for and can not control, but in many cases her influence can bring marked improvement, and her ultimate success depends upon these improvements being made under her direction.

I. HYGIENE:

1. *Location:* The highest point in town, or at least a point higher than the immediate vicinity and not closed in by buildings or other obstructions; not on a dusty street or in range of factory smoke; away from street car lines and noisy ma-

chinery; in a healthful and moral environment, preferably in a respectable home settlement or in a native grove.

2. *Soil:* Mixture of gravel and sand with no free clay; free from decayed animal or vegetable matter; well drained in at least two directions from the building; free from noxious ground air such as would arise from a subsoil filling of trash and garbarge.

3. *Capacity:* Buildings should be ample for present needs and capable of meeting future needs till the material is well worn; grounds should be ample for all present and future needs for play, gardening, trees and artistic effect.

4. *Water:* Should come from spring or deep well; should be pure for drinking purposes; should be abundant for drinking, cleaning, irrigation of flowers, etc.; should be properly inspected and reported upon every few weeks by teacher or other sanitary expert.

5. *Toilets:* Should have plenty of direct sunlight; should be well screened and ventilated with air vent at the floor; concrete or matched board floors and porcelain receivers; one seat to each fifteen girls and a seat and a urinal to each thirty boys.

6. *Cloak Rooms:* With direct sunlight; heat for drying; ventilated with duct above the racks leading out of the building; situated at the teacher's end of the room.

7. *Passages:* Should be wide enough to allow marching lines; well lighted with no dark ends for junk; convenient to each room; unobstructed by chairs, racks, stoves, fuel, etc.

8. *Floors:* Should be swept with hair broom and room dusted with oiled cloth, or cleaned with vacuum cleaner; perfectly smooth with no cracks or splinters; well and frequently oiled; disinfected often with formaldehyde and daily with floor sweep. The presence of a straw broom or feather-duster will be sufficient warrant for marking all four points zero.

9. *Sittings:* Should be single seats and desks, adjustable for seat desks and desk inclination; should be adjusted to the

child, seat about 2/7 and desk about 3/7 of his height, inclination about 22½ degrees for book rest and about 15 degrees for writing; edge of seat to overlap seat of proper width about 2 inches. For even one seat to violate these conditions is fatal to the score. Probably there is no greater crime against childhood than to hang a child all day on a seat too high for him or to compress him into one too small. Fit the seat to his body as carefully as you would fit a garment.

10. *Lighting:* Should come from one side only; bottom of window should be high, top not more than 6 inches from ceiling; should fall on pupil's left; window space about 1/5 of the floor space for dark days and adjusted with blinds to reduce the amount on bright days.

11. *Heating:* Heated by steam, hot air, hot water, or properly installed jacketed stove; should be evenly distributed over the house and especially over the rooms; easily regulated by the teacher in charge; well understood and properly managed by the janitor. Three or four inexpensive thermometers distributed over each room will indicate whether results are being achieved.

12. *Ventilation:* Air introduced pure and unbaked; humidified by the introduction of steam or vapor into the entering duct; properly distributed by some sort of forced system; supplied at the rate of 30 cubic feet per child per minute without draft. One should ventilate for pure air supply and not as a device of temperature control. Many times a cold room needs ventilation more than a warm one.

II. Equipment:

13. *Laboratory:* There should be selected and sufficient amount for all subjects taught which can and should use apparatus; supplies should be properly arranged for each subject; ventilated so as to prevent gases from chemical experimentation from escaping into the rooms; counters, shelves, bottles, etc. kept scrupulously clean, conveniently arranged, and properly labeled.

14. *Library:* Should have large reading room or have ample reading space at tables; contain latest dictionaries and cyclopedias; duplicate copies of texts and enough copies of supplementary sets for the large classes; single copies of books for general reading for teachers, patrons, and for children of the ages enrolled, with an effective system of charging out. Where the school is in range of a public library and has active connection with it, these items may be considered satisfied. Results in effective school work with the formation of reference and reading habits are all that is desired. Whatever school machinery accomplishes that is satisfactory, but it takes some well worked system to accomplish it.

15. *Auditorium:* Situated on the first or second floor with fire escape exits; furnished with dressing rooms, stage, movable chairs, etc.; well and attractively finished; capacity suitable for assembly and social center work.

16. *Drinking facilities:* Bubbling fountain with automatic shut-off, or individual drinking cups; container made of noncorosive material and properly cooled; separate for boys and girls and convenient to playground and gymnasium; waste properly drained off. The medical injunction of good water externally, internally and eternally should be followed. Proper growth and health can not be expected in young human shrubs which are not properly watered.

17. *Blackboards:* Should be of slate, ground glass, or hyloplate; should cover at least a side and an end in a strip 3 feet wide; bottom to come to the average child's waist line; screened chalk troughs at the bottom. Free chalk dust becomes disease laden and is a mechanical irritant to the air passages in breathing. Laws now prevent dust in factories and mines. Schools should not wait to be compelled.

18. *Recreation:* Ample grounds for organized play; well kept flower garden as outside decoration; rest room which may be kept quiet for pupils and teachers; equipment of play apparatus in good repair and properly supervised.

19. *Miscellaneous:* Teacher's desk and chair in each room;

clock in each room visible to both pupils and teacher; piano, organ, or victrola; community museum of local industries and products.

III. Aesthetic:

20. *Grounds:* Trees arranged so as to furnish shade and not obstruct play activities; walks to out-houses and to exits from grounds; free from weeds or rubbish; under the care in vacation of some responsible person or committee. Attention to some of these things will go far towards inspiring community pride and thus giving a type of training too often negected in the home.

21. *Finish of buildings:* Should be in good repair; of excellent workmanship; best quality of material; artistically designed to set off the surrounding landscape.

22. *Decoration:* Inside finished in light buff with no gloss; ceiling lighter than the walls; window shades yellow or green; pictures and pot flowers harmonizing with other interior decoration.

IV. Economics:

23. *Materials:* Brick, stone or good quality of wood; appropriate for the use; inexpensive after other considerations; materials that can be easily obtained for repairs.

24. *Utility of space:* Proper shape to secure light; not more than two stories above basement; ceilings not more than 14 feet high; convenient for passing of lines and school work.

25. *Repairs:* Made immediately; with proper material and the "patch" concealed; good workmanship; supervised in a business-like manner.

[Extra copies of "Schedule A" and "Schedule B" printed separately, in pads of one hundred each, may be obtained from the University Co-operative Society at 50 cents per pad.]

SELECTED BIBLIOGRAPHY

Bennett, H. E. School Efficiency, Ginn & Co., Dallas. $1.25.
A recent and very excellent treatment.

Kendall & Mirick. How to Teach the Fundamental Subjects. Houghton Mifflin Co., Chicago. $1.40.
A practical treatment based on experience.

Freeman, F. M. The Psychology of the Common Branches, Houghton Mifflin Co., Chicago, Ill.
Treatment based mainly on scientific data.

Rapeer, L. W. and Others: Teaching Elementary School Subjects, Scribners, Chicago, Ill.
A compilation of treatments by several authors all experts in their field.

Sandwick, R. L. How to Study and What to Study, D. C. Heath & Co., Chicago, Ill.
An excellent little treatise on the relative value of subjects and the approach to them.

Whipple, G. M. How to Study Effectively, Public School Publishing Co., Bloomington, Ill.
A brief manual for those who would direct themselves or others in proper methods in mental work.

Wilkinson, W. A. Rural School Management, Silver, Burdett & Co., Chicago, Ill.
The newest and probably the best treatment on the subject.

SCHEDULE B.

The School Plant.

Note: 100 Rectangles=100%—Mark 1% for each.

I. The Plant Should be Hygienic (12 rubrics, 48%)

1. Location	High	Dustless	Noiseless	Hygienic environment
2. Soil	Porous	Native	Drained	Non-gaseous
3. Capacity	Present needs, Buildings	Future needs, Buildings	Present needs, Grounds	Future needs, Grounds
4. Water	Source	Character	Amount	Properly inspected
5. Toilets	Sun light, Ventilated	Screened, Disinfected	Properly Constructed	Situation, capacity
6. Cloakroom	Lighted	Heated	Ventilated	Situation
7. Passage and halls	Wide	Lighted	Convenient	Unobstructed
8. Floors	Well kept	Smooth	Oiled	Disinfected
9. Sittings	Single	Adjustable	Adjusted	Spaced
10. Lighting	Unilateral	High	To left	Sufficient
11. Heating	Character	Distributed	Regulated	Managed
12. Ventilation	Nature	Humidity	Distributed	Sufficient

II. It Should Be Well Equipped (7 rubrics, 28%)

13. Laboratory	Sufficient	Well kept	Ventilated	Arranged
14. Library	Read. room	Ref. works	Sup. read'g.	Gen'l. reading
15. Auditorium	Situation	Furnished	Finished	Capacity
16. Drinking facilities	Bubbling fountain or individual cup	Cooled	Convenient	Care of waste
17. Blackboard	Material	Amount	Situation	Care, use
18. Recreation	Playgrounds	Flower gar.	Lunch room	Play appar.
19. Miscellaneous	Teacher's desk and chair	Clock	Piano and organ	Museum

III. It Should Be Aesthetic (3 rubrics 12%)

20. Grounds	Trees	Walks	Clean	Care
21. Finish	Condition	Workmanship	Material	Design
22. Decoration	Walls	Ceilings	Shades	Pictures

IV. It Should Be Economical (3 rubrics 12%)

23. Materials	Durable	Appropriate	Inexpensive	Remediable
24. Space	Proper shape	No. stories	Ht. of ceil.	Arrangement
25. Repairs	Made immediately	Prop. mater'l.	Good workmanship	Supervision

Teacher.....

School..... Grades..... Date..... Signed.....

SCHEDULE B.

The School Plant.

Note: 100 Rectangles=100%—Mark 1% for each.

I. The Plant Should be Hygienic (12 rubrics, 48%)

1. Location	High	Dustless	Noiseless	Hygienic environment
2. Soil	Porous	Native	Drained	Non-gaseous
3. Capacity	Present needs, Buildings	Future needs, Buildings	Present needs, Grounds	Future needs, Grounds
4. Water	Source	Character	Amount	Properly inspected
5. Toilets	Sun light, Ventilated	Screened, Disinfected	Properly Constructed	Situation, capacity
6. Cloakroom	Lighted	Heated	Ventilated	Situation
7. Passage and halls	Wide	Lighted	Convenient	Unobstructed
8. Floors	Well kept	Smooth	Oiled	Disinfected
9. Sittings	Single	Adjustable	Adjusted	Spaced
10. Lighting	Unilateral	High	To left	Sufficient
11. Heating	Character	Distributed	Regulated	Managed
12. Ventilation	Nature	Humidity	Distributed	Sufficient

II. It Should Be Well Equipped (7 rubrics, 28%)

13. Laboratory	Sufficient	Well kept	Ventilated	Arranged
14. Library	Read. room	Ref. works	Sup. read'g.	Gen'l. reading
15. Auditorium	Situation	Furnished	Finished	Capacity
16. Drinking facilities	Bubbling fountain or individual cup	Cooled	Convenient	Care of waste
17. Blackboard	Material	Amount	Situation	Care, use
18. Recreation	Playgrounds	Flower gar.	Lunch room	Play appar.
19. Miscellanecus	Teacher's desk and chair	Clock	Piano and organ	Museum

III. It Should Be Aesthetic (3 rubrics 12%)

20. Grounds	Trees	Walks	Clean	Care
21. Finish	Condition	Workmanship	Material	Design
22. Decoration	Walls	Ceilings	Shades	Pictures

IV. It Should Be Economical (3 rubrics 12%)

23. Materials	Durable	Appropriate	Inexpensive	Remediable
24. Space	Proper shape	No. stories	Ht. of ceil.	Arrangement
25. Repairs	Made immediately	Prop. mater'l.	Good workmanship	Supervision

Teacher.....

School..... Grades..... Date..... Signed.....

SCHEDULE A.

Efficiency of Instruction Score Card.

Notice to Observer: Keep this before you in checking recitation.

Rubric	Value: 10—Excellent	8—Good-Fair	6—Fair-Poor	4—Very Poor
1. The Room	Invigorating air, room neat, furniture well ordered, artistic decorations of pictures, plants, etc.	Air not noticeable, room neat, well arranged, no decorations.	"Stuffy" air, neat room, bare, poorly arranged, etc.	Depressing air, room bare, unnecessarily littered.
2. The Teacher	Beautiful, attractively dressed, excellent manner, modulated voice, etc.	Comely, plainly but neatly dressed, sincere manner, clear voice.	Common, too plainly dressed, passive manner, voice weak.	Homely, sloven, unpleasant manner, harsh voice.
3. Companionship	Co-operative, sympathetic, friendly, courteous and tolerant. (Both teacher and pupils.)	Any four present of the foregoing.	Any three present of the foregoing.	Any two present of the foregoing.
4. Discipline	Pupils not forced, but govern themselves.	No misconduct, yet outside force is apparent.	Misconduct, yet properly corrected.	Misconduct and improperly corrected.
5. Study Classes	Pupils systematically directed to put forth self-effort.	System exists, but poorly managed.	Pupils busy, but with no system.	Study class disturbs recitation.
6. Assignment	New connected with old, real interest aroused in new.	Connection made without interest.	New lesson is merely explained.	Made by pages or topics without comment.
7. Methods	Subject-matter and devices fit age and development of pupils. Time economized. Initiative developed.	No serious delay, but part of foregoing lacking.	Recitation slow, direction confusing.	Poor devices and methods, too much aimless talking.
8. Knowledge	Logical discussions, written work, quick response.	Proper response, poor discussion, but facts known.	Understanding of subject matter only fair.	Rote memory and bookish replies.
9. Appreciation	Pupils eagerly grasp thought and show appreciation by remarks as to value.	Pupils ask questions. (Earnest.)	Silent attitude of attention.	Disgusted, bored.
10. Results	Mental and Physical Habits show development.	Response in review, etc.	Fair ability only as shown in conversation, etc.	Pupils too forgetful.

Teacher..... **School**..... **Grade**..... **Date**..... **Signed**.....

SCHEDULE A.

Efficiency of Instruction Score Card.

Notice to Observer: Keep this before you in checking recitation.

Rubric	Value: 10—Excellent	8—Good-Fair	6—Fair-Poor	4—Very Poor
1. The Room	Invigorating air, room neat, furniture well ordered, artistic decorations of pictures, plants, etc.	Air not noticeable, room neat, well arranged, no decorations.	"Stuffy" air, neat room, bare, poorly arranged, etc.	Depressing air, room bare, unnecessarily littered.
2. The Teacher	Beautiful, attractively dressed, excellent manner, modulated voice, etc.	Comely, plainly but neatly dressed, sincere manner, clear voice.	Common, too plainly dressed, passive manner, voice weak.	Homely, sloven, unpleasant manner, harsh voice.
3. Companionship	Co-operative, sympathetic, friendly, courteous and tolerant. (Both teacher and pupils.)	Any four present of the foregoing.	Any three present of the foregoing.	Any two present of the foregoing.
4. Discipline	Pupils not forced, but govern themselves.	No misconduct, yet outside force is apparent.	Misconduct, yet properly corrected.	Misconduct and improperly corrected.
5. Study Classes	Pupils systematically directed to put forth self-effort.	System exists, but poorly managed.	Pupils busy, but with no system.	Study class disturbs recitation.
6. Assignment	New connected with old, real interest aroused in new.	Connection made without interest.	New lesson is merely explained.	Made by pages or topics without comment.
7. Methods	Subject-matter and devices fit age and development of pupils. Time economized. Initiative developed.	No serious delay, but part of foregoing lacking.	Recitation slow, direction confusing.	Poor devices and methods, too much aimless talking.
8. Knowledge	Logical discussions, written work, quick response.	Proper response, poor discussion, but facts known.	Understanding of subject matter only fair.	Rote memory and bookish replies.
9. Appreciation	Pupils eagerly grasp thought and show appreciation by remarks as to value.	Pupils ask questions. (Earnest.)	Silent attitude of attention.	Disgusted, bored.
10. Results	Mental and Physical Habits show development.	Response in review, etc.	Fair ability only as shown in conversation, etc.	Pupils too forgetful.

Teacher..... School..... Grade..... Date..... Signed.....

B156-1017-5m

University of Texas Bulletin

No. 1740: July 15, 1917

ANNOUNCEMENT

OF

CORRESPONDENCE COURSES

IN THE DIVISION OF

EXTENSION TEACHING

DEPARTMENT OF EXTENSION

Published by the University six times a month and entered as second-class matter at the postoffice at
AUSTIN, TEXAS

The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston

Cultivated mind is the guardian genius of democracy. . . . It is the only dictator that freemen acknowledge and the only security that freemen desire.

Mirabeau B. Lamar

CONTENTS

	Page
Officers of Administration	5
Divisions of Department of Extension	5
Correspondence Faculty	7
The Division of Extension Teaching—Correspondence Instruction	9
Teaching by Mail	9
Types of Students	9
Kinds of Work	10
Instruction	11
Admission to Correspondence Courses	11
Fees	12
How to Register	12
Books	12
Regulations	12
Examinations	15
University Credit	15
Scholarships	16
General Catalogue	16
Announcement of Courses	17
College of Arts—	
Applied Mathematics	17
Botany	19
Business Administration	22
Economics and Sociology	26
English	30
French	34
Geology	36
German	37
Government	42
Greek	45
History	46
Home Economics	50
Latin	51
Philosophy and Psychology	53
Physics	54
Public Speaking	54
Pure Mathematics	56
Spanish	60
Zoology	61
Department of Education	63
Department of Engineering—	
Architecture	69
Civil Engineering	71
Drawing	71
Department of Law	73
Courses Preparatory to Teacher's Certificates	78
Appendix A—Admission Requirements to the University	83
Appendix B—Information Concerning State Teachers' Certificates	88

OFFICERS OF ADMINISTRATION

Robert E. Vinson, D. D., LL. D., President of the University.
Edwin Dubois Shurter, Ph. B., Professor of Public Speaking; Director of the Department of Extension.
Houston Smith, Secretary of the Department.

DIVISIONS OF THE DEPARTMENT OF EXTENSION

Thomas Fletcher, M. A., Head of the Division of Extension Teaching; Professor of Secondary Education first half of session of 1917-18.
Raymond George Bressler, M. A., M. S., Head of Division of School Interests; Lecturer on Rural Sociology; Head of Extension Teaching for first half of session of 1917-18.
William K. Hall, Registrar of the Division of Extension Teaching.

Mary E. Gearing, Professor of Home Economics; Head of the Division of Home Welfare.
Minerva Lawrence, B. S., Lecturer on Home Economics.
Caroline Cook, B. S., Lecturer on Home Economics.

James W. Shepherd, M. A., Head of the Division of Information.
Erle Racey, Manager of Exhibits.
Dan E. McCaskell, Manager of Exhibits.

Le Noir Dimmitt, B. A., Extension Loan Librarian.
Jean D. Campbell, Assistant.
Louise W. Morris, Reader.

William Deming Hornaday, Head of Division of Public Lectures and Publicity.
Mrs. Charles Stephenson, Student Cataloguer.

William Septimus Taylor, M. S., Head of Division of School Interests for first half of session of 1917-18; Associate Professor of Agricultural Education.
Edward Everett Davis, M. A., Lecturer on Rural Education.
Amanda Stoltzfus, L. I., Lecturer on Rural Education.
Roy Bedichek, B. S., Assistant Director of Interscholastic League.
Willie May Thompson, Secretary of the Interscholastic League.

FACULTY

College of Arts

Aynesworth, Anne, M. A., Tutor in English.

Barnes, J. A., B. A.

Bond, Otto Ferdinand, M. A., Instructor in Romance Languages.

Brogan, Albert Perlay, Ph. D., Adjunct Professor of Philosophy.

Calhoun, John William, M. A., Associate Professor of Pure Mathematics.

Casteel, Dana Brackenridge, Ph. D., Associate Professor of Zoology.

Decherd, Mary Elizabeth, M. A., Instructor in Pure Mathematics.

Dodd, Edward Lewis, Ph. D., Associate Professor of Actuarial Mathematics.

Duncan, William Bricen, B. A., Curator of the Chemical Laboratory.

Dunn, William Edward, Ph. D., Adjunct Professor of Spanish-American History.

Ettlinger, Hyman Joseph, M. A., Adjunct Professor of Applied Mathematics.

Gearing, Mary Edna, Professor of Home Economics; Head of the Division of Home Welfare of the Department of Extension.

Graff, Fritz William, B. A., Secretary to the President; Editor of University Publications.

Griffith, Reginald Harvey, Ph. D., Associate Professor of English.

Gutsch, Milton Rietow, Ph. D., Adjunct Professor of Medieval History.

Haines, Charles Grove, Ph. D., Professor of Government.

Hall, Guillermo Franklin, B. S., Adjunct Professor of Romance Languages.

Hartmann, Carl Gottfried, Ph. D., Associate Professor of Zoology.

Heflin, Bess, M. A., Instructor in Home Economics.

Hendrix, William Samuel, M. A., Adjunct Professor of Romance Languages.

James, Herman Gerlach, J. D., Ph. D., Associate Professor of Government; Director of the Bureau of Municipal Research and Reference.

Kiehne, John Matthias, Ph. D., Associate Professor of Physics.

Lavender, Roberta Frances, M. A., Instructor in Latin.

Lofberg, John Oscar, Ph. D., Instructor in Greek.

Manning, William Ray, Ph. D., Associate Professor of Latin-American and English History.

Marsh, Frank Burr, Ph. D., Adjunct Professor of Ancient History.

Miller, Edmund Thornton, Ph. D., Professor of Economics.

Panton, Edward Thurber, M. A., Secretary of the Bureau of Municipal Research and Reference.

Payne, Leonidas Warren, Ph. D., Associate Professor of English.

Penick, Daniel Allen, Ph. D., Professor of Greek.

Perrin, F. A. C., Ph. D.

Prokosch, Eduard, Ph. D., Professor of Germanic Languages.

RAMSDELL, CHARLES WILLIAM, Ph. D., Professor of American History.
RICE, CHARLES DONNELL, M. S., Associate Professor of Applied Mathematics.
SHURTER, EDWIN DUBOIS, Ph. B., Professor of Public Speaking: Director of the Department of Extension.
SIMONDS, ANNNA WOOD, B. A., Special Correspondence Instructor.
SIMONDS, FREDERIC WILLIAM, Ph. D., D. Sc., Professor of Geology.
THOMPSON, STITH, Ph. D., Instructor in English.
TRELEVEN, JOHN EDWARD, M. A., Professor of Business Administration.
WHAREY, JAMES BLANTON, Ph. D., Adjunct Professor of English.
WOLFE, ALBERT BENEDICT, Ph. D., Professor of Economics and Sociology.
WUPPERMAN, WALTER OTTO, B. A., Assistant in German; Special Correspondence Instructor.
YOUNG, MARY SOPHIE, Ph. D., Instructor in Botany.
YARBROUGH, JAMES, M. A., Instructor in Psychology.

Department of Education

EBY, FREDERICK, Ph. D., Professor of the History of Education.
GRAY, CLARENCE TRUMAN, Ph. D., Adjunct Professor of the Art of Teaching.
SACKETT, LEROY WALTER, Ph. D., Adjunct Professor of the Psychology of Education.
SHEPHERD, JAMES W., M. A., Head of Division of Information, Department of Extension.

Department of Engineering

BANTEL, EDWARD CHRISTIAN HENRY, C. E., Professor of Civil Engineering; Assistant Dean of the Department of Engineering.
FINCH, STANLEY PHISTER, M. S., C. E., Adjunct Professor of Civil Engineering; Research Associate in the Division of Engineering of the Bureau of Economic Geology and Technology.
GIDEON, SAMUEL EDWARD, Associate Professor of Architecture.
GIESECKE, FRIEDERICH ERNST, M. S. in Architecture, Professor of Architecture; Head of the Division of Engineering of the Bureau of Economic Geology and Technology.
JEFFERSON, NELLIE, B. S., Tutor in Architecture.
ROWE, CHARLES ELMER, B. S., Associate Professor of Drawing.
TAYLOR, THOMAS ULVAN, M. C. E., Professor of Civil Engineering; Dean of the Department of Engineering.

Department of Law

COFER, ROBERT EMMET, LL. B., Professor of Law.
HILDEBRAND, IRA POLK, B. A., LL. M., Professor of Law.
TARLTON, BENJAMIN DUDLEY, B. A., LL. B., Professor of Law.

THE DIVISION OF EXTENSION TEACHING

Correspondence Instruction

Teaching by Mail. Teaching by correspondence has long since passed the experimental stage. While the University recommends resident work when residence is possible, believing that the experience of meeting and mixing with fellow-students and the consequent training in real democracy, as well as the personal contact with and inspiration from the teachers, is invaluable, yet the authorities of the University also realize that correspondence study offers substantial advantages. In correspodence instruction the teaching is entirely individual; each student, no matter how diffident or how lacking in aggressiveness, comes into individual relation with the instructor in a way impossible in the crowded class-room. He recites the whole of every lesson with a consequent advantage to himself that is obvious. Full opportunity is given to discuss all difficulties in writing, and this written discussion in itself affords valuable training. Further, a correspondence student is not hampered by the usual time regulations; he may take up a study at his convenience without awaiting the fixed date of a college term, and he may push the work to completion as rapidly as he is able to master it. Moreover, correspondence work develops in a marked degree initiative, self-reliance, accuracy, and above all, perseverance.

Types of Students. Correspondence instruction appeals to a wide circle. Its influence is not limited, as is the work of the regular sessions, to such people as can afford to give their entire time to study. To the following types of students correspondence courses should make a special appeal:

(1) *Graduates of Affiliated Schools*, who, though forced by necessity into money-earning labor, and unable to attend college, desire to continue their education beyond high-school training.

(2) *Graduates of Non-Affiliated Schools*, who, upon presenting satisfactory evidence of their fitness to pursue advanced work, may be permitted to take courses by correspondence. The acceptance of such students does not imply that the University will remit any of its admission requirements for resident students, even though the applicants make satisfactory records in the correspondence work.

(3) *Teachers* who desire to raise their certificates to a higher grade by preparing for the State examination (see pp. 78-82); and others who feel the need of more thorough knowledge and special training in the branches they teach.

(4) *Prospective Students of Law and Medicine* who are unable to attend the University to secure the academic credits which are pre-

requisite to entrance to the Law Department at Austin and the Medical Department at Galveston, and wish to make up this work by means of correspondence courses and summer session courses while carrying on their outside work.

(5) *College Students* who, for financial or other reasons have been forced to drop out of attendance for a time and desire to continue their college work so as to keep abreast of the resident courses and be able to resume work with their classes upon reentering school.

(6) *Isolated Persons* who are out of reach of good lectures and libraries, and who yet wish the advantages of contact with educational institutions.

(7) *Any Citizen of Mature Age* may apply for correspondence courses, and unless the preparation is totally inadequate such applicants will be given an opportunity to test their ability to do the work. The responsibility rests with the applicant, however, and in no case will the fee be refunded after the course is once under way.

(8) *Organizations*, such as women's clubs, debating and literary societies, and business associations, as well as teachers' clubs, who need the assistance of University professors in working out their year's programs, and who need the use of libraries in connection with their programs. To these the group-study courses, a bulletin of which will be sent upon request, are of great assistance.

Kinds of Work. A *correspondence course* is one-third of a full course as given in the University regular session, and, in the credit work, parallels the fall, winter, or spring term's work in a subject as given during the long session. For example, the correspondence course *English 1(f)*, as described on p. 30 of this bulletin, is only one-third of the full freshman course, English 1, which runs throughout the three terms of the long session. The work available by means of correspondence may be grouped as follows:

(1) A few courses, mainly in mathematics and the languages, that may be credited as admission requirements.

(2) Courses of college grade. The work offered by means of these courses is practically the equivalent of the courses bearing the same numbers offered during the long session.

(3) Courses preparatory to Teacher's Certificates. The list of courses preparatory to teacher's certificates includes most of the subjects in which candidates for first-grade, permanent primary, and permanent certificates, are examined. For general statements concerning certificates see Appendix B, and for details concerning particular courses see pages

(4) Business and Vocational Courses. A number of courses designed to meet the needs of persons who do not expect to go to college but who want work that will be of immediate practical benefit

to them are also offered. Some of these courses carry college credit and some do not, as is stated in each particular instance.

Students who desire courses which are not found in this bulletin should write to the head of the Division of Extension Teaching, stating their desires as accurately as possible. It may be possible in special cases to give the work desired.

In addition to the correspondence courses *group-study courses* have been organized for clubs and other organizations who wish to take up for their year's program some special topic under the direction of a University professor. For full information with regard to these courses write for the group study bulletin.

Instruction. The correspondence courses are under the direction of regular University faculty members. The work of each course has been carefully considered, and in most instances is the result of experience in the needs of the average student. Each course gives a systematic presentation of its subject. The work is covered in from ten to twenty-five assignments, at the discretion of the instructor, but in each case the work is the equivalent of one-third of a residence course. The usual number of lesson assignments is ten, or the equivalent of one each week for the time covered by one term's work, or one-third of the long session, in residence.

In general a lesson contains (1) a definite assignment of the work in the text and reference books; (2) directions and suggestions concerning the study of the assignment; and (3) questions to test the student's mastery of the lesson assigned.

After preparing the lesson, the student writes out answers to the questions, and makes as clear a presentation as possible of the difficulties he has met. Upon the receipt of the lesson papers, the instructor corrects the work and returns it to the student as promptly as possible. In this way a correspondence student has personal advice and instruction throughout the course.

Admission to Correspondence Courses. No entrance examination is required of applicants for correspondence courses; but before allowing a student to register for a course, the University requires that certain information be furnished upon a formal application blank, and reserves the right to reject the application if the data furnished on the blank justify such action. *Registration for correspondence courses may take place at any time.* The work goes on throughout the summer as well as during the regular sessions of the University. Intermissions in the prosecution of a course may sometimes occur when the instructor is away on his vacation, but as far as possible, substitutes will be provided so that the work may continue without interruption.

For full information as to the entrance requirements of the Univer-

sity, the student is referred to the general catalogue of the University and to Appendix A of this bulletin.

Fees. The registration fee for each *correspondence course* is $7.00, payable in advance.

Certain courses in Law are double courses, and for these a fee of $14 is charged.

After a student registers for a course and is accepted, the course is considered "under way," *and the registration fee is not returnable.*

The necessary textbooks and equipment must be purchased by the student. Inability to secure textbooks promptly will not be accepted as an excuse for failure to get the course under way.

Money for books and supplies should not be sent to the Department of Extension.

The student must pay full postage one way on the lesson papers. The University pays the return postage.

Money should be sent by postal or express orders or by checks drawn at any of the large cities of the state, and *should be made payable to the Department of Extension.*

How to Register. The prospective student should *fill out and return a separate registration blank for each correspondence course desired, giving all the information asked for on each blank. He should enclose $7.00 for each blank so filled, except in the case of a double course, for which a fee of $14.00 is required.*

Each blank space *must contain its appropriate information.*

Books. *Money for books and supplies should in no case be sent to the Department of Extesion.* Textbooks, maps, etc., for use in the various courses may be obtained from the University Cooperative Society, University Station, Austin; from the publishers; or from local dealers. The cost will ordinarily vary from $1.00 to $9.00 for a correspondence course, the average being perhaps under $3.00. The student should await specific directions from the instructor before ordering the books for any given course.

The University Cooperative Society will send textbooks and supplies upon receipt of check or money order to cover the cost plus transportation. If the student fails to enclose an amount sufficient to cover transportation charge, the books will be sent by express collect.

The University Library will lend reference books to correspondence students when same are available. The student is expected to pay transportation charges both ways on these books. He is requested to return such books as quickly as possible, since they will be in demand at all times.

Regulations. (1) The time allowed for the completion of a correspondence course is one year, but in cases of sickness, absence

of instructor, or interim due to residence work, the time may be extended to one year and a half. The time required to complete any correspondence course is entirely dependent upon the preparation and the ability of the particular student and upon the time he has to devote to the work. The slight delay of the mails is immaterial, especially if the student is carrying as many as two courses simultaneously, when he will usually have enough work assigned to employ his time fully. Each correspondence course covers the ground of one term of residence work, and should be easily completed within ten weeks.

(2) Credit will not be granted for any correspondence course within thirty days from the date of the approval of a registration. The purpose of this regulation is to prevent students from attempting to do correspondence work for credit too hurriedly.

(3) If at any time after the date of registration a student fails for a priod of three months to report to his instructor, his registration lapses, and at the discretion of the instructor he may be dropped. When a student has been dropped for failure to report to his instructor, he may at any time within a year after the date of his registration be reinstated in the course upon payment of a fee of one dollar. After the lapse of one and a half years, including extensions of time, from the date of registration, students who for any cause have been dropped must make a new application and pay the full registration fee to resume a given course. *In no case will the registration fee be refunded.*

(4) Promptness and punctuality on the part of both student and instructor are vital to the success of correspondence work. Students are therefore earnestly urged to report to their instructors at least once every two weeks.

(5) Students who have made F or G on a course taken in residence will not be allowed to register for the same course in the Division of Extension Teaching.

(6) Students in residence at the University or at any other institution of learning may not register for courses in the Department of Extension except upon the approval of the president or dean of the college or department concerned and of the head of the Division of Correspondence Instruction. Students who contemplate doing residence work in any of the regular terms of the University should state this fact at the proper place in the application blank.

(7) Students who are under a disciplinary sentence by the University, such as suspension, will not be allowed to register for correspondence courses until the expiration of the sentence.

(8) No student may transfer his registration to another student; each student must register for himself and not in conjunction with another.

(9) Transference of registration from one course to another is

not permitted except in cases where accident may prevent the instructor from continuing the course or offering the work promptly, or where some mistake in the grade or classification of the student has been made. *In no case will the registration fee be refunded after a course is under way.*

(10) Each student must do his own work independently. If it is discovered or even suspected that a student is getting unfair assistance in his work, no credit will be allowed; and the student may be dropped from the course.

(11) *In no case will exemption from examination in correspondence courses be recognized if college credit is to be given.* The examination need not be taken if no credit is desired. In general, however, students who complete courses should take the examination and secure the credit certificates.

(12) The lesson sheets and papers belong to the student, but no student is expected to display the material promiscuously or to allow other students to use the questions or lesson papers in any way. Evidence of improper use of another's material will be considered as a breach of honor.

(13) Acceptance of a student by the Division of Extension Teaching of the Department of Extension does not imply admission to the University. Students who desire to enter the University at either of the regular sessions must meet the admission requirements in some one of the ways laid down in the general catalogue of the University. For a statement of admission requirements, see Appendix A.

The following definite instructions should be observed by each correspondence student: Use single-sheet letter-size paper (about 8 or 8½ by 10½ or 11 inches), ruled or unruled, and leave wide margins for the instructor's notes. The regular student's notebook with perforated detachable sheets is extremely desirable, and can be purchased from the University Cooperative Society at Austin for about sixty cents. Light weight paper may be used if the student prefers it. All papers must be written in ink, and upon one side of the paper only. Typewritten work will be accepted only when the student does his own typing. The name of the course, name and address of the student, and date of mailing the lesson must be written at the top of the first sheet of each lesson paper. Each page of the lesson paper should be numbered, and the pages should be carefully arranged in the proper order. Full credit will not be given for carelessly written or improperly prepared papers. Papers should be folded like an ordinary letter so as to fit the large-size commercial envelope, and *addressed to the instructor, not to the Department of Extension.* Full postage should be attached; usually two cents for each five sheets of paper or fraction thereof will be required, but the student should

have his lesson papers weighed to determine the exact amount of postage. The payment of overdue postage is both an annoyance and an extra expense to the instructor.

Correspondence students are requested to take up with their instructors only such points as relate to their studies. All business matters should be taken up with the office of the Division of Extension Teaching.

Examinations. *Exemptions from examinations will in no case be recognized if the student wishes to secure college credit.* If a student does not desire credit towards a degree, the examination need not be taken.

To secure credit toward a degree, the student in a correspondence course must pass an examination on the course either at the University or at some designated place. By making arrangements with some examiner acceptable to the University authorities, such as a county superintendent or the local superintendent or high-school principal, the student will be enabled to take the examination without leaving home. The instructor must be furnished with the name of the local supervisor, and a convenient time of holding the examination must be agreed upon. Correspondence examination papers will be graded according to the standards applied in grading term examination papers handed in by resident students. The grades of all students will be kept on the permanent records of the University. A credit certificate will be sent to the student upon the successful completion of each correspondence course. Certificates are issued, and grades reported to the Registrar on the fifteenth of each month. Courses completed after this date will not be reported until the fifteenth of the following month.

University Credits. *Each correspondence course which carries college credit includes the amount of work required in one-third of a course taken in residence at the University.*

Each correspondence course of college grade will follow as closely as possible some third of a course offered to resident students, and will count as one-third of a course toward a degree upon precisely the same terms as the corresponding work done in residence (see the general catalogue of the University), subject to the following restrictions:

(1) *Not more than half of the courses required for any degree may be done by correspondence, and no degree will be conferred without a residence of at least one year at the University.*

(2) Not more than one-third of the courses required for the degree of bachelor of laws may be done by correspondence, and it is expected that the more advanced work shall be taken in residence.

(3) In case a student presents advanced credits from another institution, not more than half of the remaining courses necessary for

his degree may be taken by correspondence. Application for advanced standing should be addressed to the committee on admission from other colleges.

(4) To secure credit toward a degree, the student in a correspondence course must pass an examination on the course either at the University or at some designated place. For fuller information on this point, see the paragraph on Examinations, page 19.

Scholarships. In 1913, the Board of Regents of the University authorized the granting of resident scholarships to correspondence students who complete as many as five full courses (fifteen thirds or correspondence courses) with an average grade of *B*. These scholarships are similar to the affiliated school scholarships, and entitle the holder to exemption from matriculation fees in the College of Arts, the Department of Education, and the Department of Engineering, so long as their conduct and standing are satisfactory to the faculty.

General Catalogue. Every student of the University, whether doing residence or correspondence work, should have a general catalogue, which will be sent by the Registrar of the University upon application, in order that he may properly correlate his work, and meet the requirements for the various degrees offered by the University.

ANNOUNCEMENT OF CORRESPONDENCE COURSES

Unless otherwise indicated, all courses are of college grade and may be counted toward the bachelor's degree exactly on the same conditions as are set down in the regular University catalogue. The registration fee for each correspondence course is $7. The textbooks named below may be changed from time to time, and the student should consult the instructor before ordering books. The prices of books, unless otherwise stated, are the publishers' list prices, and do not include postage or expressage. *Orders and money for books should not be sent to the Extension Teaching Division.* The correspondence courses herewith announced are arranged alphabetically according to subjects.

COLLEGE OF ARTS

APPLIED MATHEMATICS FOR ENGINEERING STUDENTS

Prospective engineering students or students who have already begun their work in the Engineering Department may register for any of the following courses in Applied Mathematics. Students who intend to take their degrees in the Academic Department, or College of Arts, are not expected to apply for these courses in Applied Mathematics. For courses in pure mathematics, see p. 58.

The correspondence courses listed here are equivalent to the similarly numbered courses in Applied Mathematics in the regular catalogue and are the courses required for all engineering degrees.

A. M. 1a. Plane Trigonometry.

This course may be taken by students who have a working knowledge of plane geometry and of algebra through quadratics. In connection with the text, attention will be given to trigonometrical identities. Especial attention will be given to practical problems and their solution by the use of logarithms. Textbook: Taylor and Puryear's *Plane and Spherical Trigonometry* (Ginn and Co., Boston, price, $1.25).

One-third college credit. Equivalent to Applied Mathematics 1a.

Mr. Ettlinger.

A. M. 1b. Advanced Algebra.

Before registering for this course, a student should have a good knowledge of algebra through quadratics. The student will review quadratics and study the solution of the quadratic and simultaneous equations of the second degree by means of graphical representation. This work will be followed by a study of imaginary numbers, progressions, theory of exponents, and logarithms. Textbook: Wilczyn-

ski and Slaughter's *College Algebra* (Allyn and Bacon, Chicago; mailing price $2.00).

One-third college credit. Equivalent to Applied Mathematics 1b.

MR. ETTLINGER.

A. M. 1c. INTRODUCTORY COURSE IN ANALYTICS.

Students who have had trigonometry and who have a fair knowledge of algebra beyond quadratics may register for this course. In connection with the text the topics studied will be co-ordinates, graphs, straight lines, circles, and transformations. There will be numerous problems and frequent tests to ascertain the progress of the student. Textbooks: Smith and Gale's *New Analytic Geometry* (Ginn and Co., Boston).

One-third college credit. Equivalent to Applied Mathematics 1c.

MR. ETTLINGER.

A. M. 104. SECOND COURSE IN ANALYTICS.

This course is a continuation of A. M. 1c. There will be given the standard equations of the second degree and their properties, equations of certain familiar curves, and the general equation of the second degree. Textbook: Smith and Gale's *New Analytic Geometry* (Ginn and Co., Boston).

One-third college credit. Equivalent to Applied Mathematics 104.

MR. ETTLINGER.

A. M. 209a. DIFFERENTIAL CALCULUS.

This course is offered to students who have completed the preceding courses in algebra and analytics or their equivalents. The topics studied will be variables, functions, limits, differentiation, maxima and minima, points of inflection, and simple integrations. Textbook: Granville's *Calculus* (Ginn and Co., Boston).

One-third college credit. Equivalent to Applied Mathematics 209a.

MR. RICE.

A. M. 209b. INTEGRAL CALCULUS.

The work of this course is based upon A. M. 209a or its equivalent as a prerequisite. Integration is the central topic of the course. There will be a study of standard forms and their application in finding areas, volumes, and lengths. Textbook: Granville's *Calculus* (Ginn and Co., Boston).

One-third college credit. Equivalent to Applied Mathematics 209b.

MR. RICE.

214w. POPULAR ASTRONOMY.

This will be a culture course for those desiring a general knowledge of descriptive astronomy. Despite the fact that astronomy is a highly developed and specialized science, a valuable knowledge of it may be gained by the general student who knows but little of mathematics, physics, or chemistry. Excellent text and reference books

exist, which a student who has a high-school training in mathematics can read without serious difficulty. Textbook: Young's *Elements of Astronomy* (Ginn and Co., Boston; price $1.60).

One-third college credit. Equivalent to Applied Mathematics 214w.

MR. RICE.

A. M. 15a. ADVANCED CALCULUS FOR ENGINEERING STUDENTS.

The topics treated will be selected to suit the needs of those interested in engineering.

Prerequisite: Applied Mathematics 3.

One-third college credit. Equivalent to Applied Mathematics 15a.

MR. RICE.

A. M. 15b. ADVANCED CALCULUS FOR ENGINEERING STUDENTS.

A continuation of A. M. 15a, which is prerequisite.

One-third college credit. Equivalent to Applied Mathematics 15b.

MR. RICE.

A. M. 15c. ADVANCED CALCULUS FOR ENGINEERING STUDENTS.

A continuation of A. M. 15b, which is prerequisite.

One-third college credit. Equivalent to Applied Mathematics 15c.

MR. RICE.

BOTANY

ELEMENTARY BOTANY

1 (f). ALGAE AND FUNGI.

A study of representative forms of the principal groups. I. Algae. (1) An introductory study of the structure of the plant cell. (2) Blue-green algae. (3) Green algae; brook silks and desmids, water net, green felt, etc. (4) Brown algae or rock weeds and kelps. II Fungi. (1) Bacteria. (2) Phycomycetes: white rust, black mold. (3) Sac fungi: yeast, downy mildew, blue mold, cup fungi. (4) Lichens. (5) Smuts and rusts. (6) Palisade fungi: Mushrooms, puff balls.

This is an elementary course. The work consists of laboratory study of fresh and preserved material, recorded in notes and drawings. and supplemented by reading. It is designed to make the student familiar with the more common representatives, and to give him a general knowledge of the groups as a whole and of their scientific and economic importance.

The following textbooks are recommended for Botany 1 (f): Curtis' *Nature and Development of Plants* (Henry Holt and Co., New York; price, $2.50); Coulter, Barnes, and Cowles' *A Textbook of Botany, Part I, Morphology* (American Book Co., New York; price $1.50);

Bergen and Davids' *Principles of Botany* (Ginn and Co., Boston; price $2.00); Atkinson's *College Botany* (H. Holt and Co., New York; price, $2.25).

The student should have a hand lens, a set of dissecting tools, and the use of a compound microscope.

One-third college credit. Equivalent to the fall term of Botany 1.

MISS YOUNG.

1 (w). BRYOPHYTES AND PTERIDOPHYTES.

A consideration of representative forms of mosses, ferns, and allied groups. I. Bryophytes: (1) Liverworts. (2) Mosses. II. Pteridophytes: (1) Ferns. (2) Scouring rushes, or horse tails. (3) Club mosses. This course is a continuation of Botany 1(f) and the same plan of work is followed. The same books and instruments are used as are required in Botany 1(f).

One-third college credit. Equivalent to the winter term of Botany 1.

MISS YOUNG.

1(s). SEED PLANTS.

A study of the vegetative organs and reproductive processes of conifers and flowering plants. A comparison of various types of flower with reference to their significance in the theory of relationships. I. Conifers: Pine. II. Flowering plants: (1) Monocotyledons: lily, grass, etc. (2) Dicotyledons: anemone mint, sunflowers, etc. A brief study of the anatomy and physiology of seed plants. This course follows Botany 1(w). The same books and instruments are used as are required in Botany 1(f).

One-third college credit. Equivalent to the spring term of Botany 1.

MISS YOUNG.

21(f). SYSTEMATIC BOTANY.

A study of representative forms of the principal alliances of monocotyledons and dicotyledons, with field and home study. Specimens of all plants studied will be preserved as herbarium mounts, and must be presented with the notes covering the work. Especial emphasis will be placed upon the relationships of the different types studied, and the determination of species will be considered of secondary importance.

Prerequisite: Botany 1, or the equivalent.

Students entering this course should provide themselves with a good dissecting microscope, and a set of dissecting instruments, including a section razor. A compound microscope is not an absolute essential, but can be used to good advantage.

One of the following books must be obtained for use:

1. Small's *Flora of the Southwestern United States.* Published by the author, Bronx Park, New York City, $4.00. P. 48.

2. Coulter's *Botany of Western Texas.* Address Superintendent of Documents, Washington, D. C.

The first-named book should be purchased by any student working east of the 100th meridian. Students working west of the 100th meridian should purchase the second.

The above manuals include in the main only wild species or those which have escaped from cultivation. For determination of cultivated species the student should have access to one of the following:

3. Gray's *Field, Forest and Garden Botany* (The American Book Co., New York; price, $1.44).

4. Bailey's *Cyclopedia of Horticulture*. Volumes I to IV (The Macmillan Co., New York). This is an expensive work, and the student is not advised to purchase it, but he should consult it in some library.

One-third college credit. Equivalent to the fall term of Botany 21.

MISS YOUNG.

21(w). SYSTEMATIC BOTANY.

This is a continuation of the work outlined under Botany 21(f), and the same books and supplies will be used.

One-third college credit. Equivalent to the spring term of Botany 21.

MISS YOUNG.

21(s). SYSTEMATIC BOTANY.

This is a continuation of the work outlined under Botany 21(f), and the same books and supplies will be used.

One-third college credit. Equivalent to the spring term of Botany 21.

MISS YOUNG.

27(f). ADVANCED SYSTEMATIC BOTANY.

The study of the flora of a given region, with especial emphasis on local distribution and the accurate determination of species. The same books and materials will be required as for Botany 21.

Prerequisite: Botany 1 or its equivalent and Botany 418 or 428.

One-third college credit. Equivalent to Botany 27(f).

MISS YOUNG.

27(s). ADVANCED SYSTEMATIC BOTANY.

A continuation of the work of Botany 27(f). The same books and instruments will be required.

Prerequisite: Botany 27(f), or Botany 21 and 418 or 428.

One-third college credit. Equivalent to Botany 27(s).

MISS YOUNG.

NOTE.—Botany 27(w) requires a large amount of lecture work, reading and special reports, and should be taken in residence.

BUSINESS ADMINISTRATION

Correspondence courses in Business Administration are divided into two groups: those equivalent to courses offered in residence in the School of Business Administration; and elementary courses designed to meet the needs of students desiring practical training in business. Courses in the first group give college credit for the work done, providing that the student satisfies the entrance requirements of the University and the prerequisites for the courses taken before demanding credit. Courses in the second group do not give college credit.

Group One: Courses for College Credit

11(f). Accounting Principles and Practice.

The operation and accounting for single proprietorship and partnership business organizations. Multicolumnar books and controlling accounts. Instruction is by means of explanations and practical bookkeeping exercises. Simple accounting problems.

Prerequisite: High-school education or its equivalent. Knowledge of bookkeeping not required, but students will find such a knowledge helpful in the course.

Text: The exercise material costs approximately $2.10 plus carriage charges. The cost of texts used will not exceed $5.00, and may be reduced in some cases by the purchase of secondhand books. The School has a small number of the texts now used, which can be loaned to a limited number of students at a charge of $1.00 for the course.

One-third college credit. Equivalent to Business Administration 11(f).

Mr. Bell.

11(w). Accounting Principles and Practice (Continued).

Practice in partnership accounting continued. Corporation accounts. Special topics, such as partnership adjustments; consignments, realization and liquidation accounts; voucher systems; the elements of costs.

Prerequisite: Business Administration 11(f).

Text: The same as Business Administration 11(f).

One-third college credit. Equivalent to Business Administration 11(w).

Mr. Bell.

11(s). Accounting Principles and Practice (Concluded).

Modern forms of the final statements and their interpretation. De-

preciation; stock accounts; bonds; reserves; sinking and other funds; deferred charges and accruals; the valuation of assets.

Prerequisite: Business Administration 11(w).

Text: The same as Business Administration 11(w).

One-third college credit. Equivalent to Business Administration 11(s).

Mr. Bell.

12(f). Accounting Theory and Problems.

A critical study of accounting theory. Particular attention to the problems of amortization, depreciation, the determination and allocation of profits; partnership adjustments; bankruptcy; the valuation of particular assets. The solution of typical problems in practical accounting. Designed to prepare students for the Certified Public Accountant's examination in theory of accounts and to a limited extent in practical accounting.

Prerequisite: Business Administration 11 or its equivalent.

Text: The student should expect to buy texts costing from $5.00 to $10.00.

One-third college credit. Equivalent to Business Administration 12(f) A.

Mr. Treleven.

12(w) A. Accounting Problems and Auditing.

Questions that arise in the practice of auditing. Methods of conducting audits. The solution of practical accounting problems. Students intending to take C. P. A. examination will find this course helpful in preparing for the examination in auditing and practical accounting.

Prerequisite: Business Administration 12(f) A.

Text: Standard texts on auditing.

One-third college credit. Equivalent to Business Administration 12(w) A.

Mr. Treleven.

9(f). Introduction to the Mathematics of Investment.

Progressions; the binomial theorem; logarithms; compound interest; discount; annuities; rent; capitalized cost; discharge of debts by equal annual payments; monetary tables. The same as correspondence course Mathematics 9(f).

Prerequisite: Mathematics 1a or 1b with a grade of at least C. If a student has had only Mathematics 1a, he will find it profitable to take Mathematics 1b (algebra) along with Business Administration 9(f).

One-third college credit. Equivalent to the fall term of Business Administration 9 or Mathematics 9.

Mr. Dodd.

9(w). The Mathematics of Investment.

Amortization; valuation of bonds; sinking funds; depreciation; building and loan associations.

Prerequisite: Business Administration 9(f).

One-third college credit. Equivalent to Business Administration 9(w) or Mathematics 9(w).

Mr. Dodd.

9(s). Introduction to the Mathematics of Life Insurance.

Permutations and combinations; probability; mortality tables; annuities; premiums; loading; policy values.

Prerequisite: Business Administration 9(f). If a student intends to take the whole of Business Administration, 9(w) may well be taken before 9(s).

One-third college credit. Equivalent to the spring term of Business Administration 9, or Mathematics 9(s).

Mr. Dodd.

Group Two: Courses Not for College Credit

A. Bookkeeping.

Principles of bookkeeping with their application to simple business conditions. The use of business forms. The development of special books of original entry. Practice in bookkeeping. From the start the various bookkeeping records are made the basis for the interpretation of business activity.

Text: The text and material required will cost $2.00-$3.00. No college credit. With B counts as one unit for entrance.

Mr. Treleven.

B. Advanced Bookkeeping.

A continuation of Business Administration A. The interpretation of the balance sheet and the revenue statement. The use of columnar books. Corporate bookkeeping.

Text: The text and material will cost $2.00-$3.00. No college credit. With A counts as one unit for entrance.

Mr. Treleven.

D. Household and Personal Bookkeeping.

The application of bookkeeping principles to household and personal accounts. The first part of the course is the same as the first part of Business Administration A. The special problems of household bookkeeping are presented in the last part of the course.

Mr. Treleven.

C. Business Correspondence.

The principles of effective letter writing. Study of the various types of correspondence such as inquiries, orders, adjustments, credit

and collection letters, sales letters, follow-up systems, applications, and recommendations. Practice in letter writing.

Prerequisite: Reasonable proficiency in the use of English.

Text: Required text costs $1.50. The purchase of a handbook of composition costing $1.00 is recommended but not required.

No college credit.

MR. TRELEVEN.

F. SHORTHAND.

This course, based upon a *Course in Isaac Pitman Shorthand* (Isaac Pitman and Sons, New York, $1.50), is intended to impart a thorough knowledge of the fundamental principles of the system. The complete course is divided into three correspondence courses, though it is expected that applicants shall take the entire series of lessons consecutively. The course will consist of prepared lesson sheets, written exercises, dictation, and supplementary reading matter, and, if credit is desired, an examination on the completion of Shorthand H, the last third of the course. No college credit will be given, but one admission unit will be allowed students who satisfactorily finish the course and are able to pass, at Austin, the proficiency test in typewriting prescribed in the University's admission requirements (Appendix A of the general catalogue). The student must make arrangements for typewriting practice satisfactory to the instructor.

MR. GRAFF.

G. SHORTHAND.

A continuation of Shorthand F, which is prerequisite.

No college credit.

MR. GRAFF.

H. SHORTHAND.

A continuation of Shorthand G, which is a prerequisite.

No college credit.

MR. GRAFF.

I. GREGG SHORTHAND.

This course, based upon *The Gregg Shorthand Manual*, is intended to impart a thorough knowledge of the fundamental principles of the system. *The Gregg Manual* (The Gregg Publishing Company, New York, $1.50) is the textbook used. The text will be supplemented by reading and writing exercises, and, if credit is desired, an examination on completion of the second half of the course. No college credit will be given, but students who complete the course creditably, and are able to pass the proficiency test in typewriting prescribed in the University's admission requirements (Appendix A of the general catalog) will be given one unit admission credit. Students must make arrangements for typewriting practice satisfactory to the instructor.

No college credit.

MR. HALL.

J. Gregg Shorthand.

A continuation of Shorthand I, in which the *Manual* will be completed.

No college credit.

Mr. Hall.

ECONOMICS AND SOCIOLOGY

Principles of Economics.

In this course the fundamental principles underlying the present-day economic system, such as the laws governing the production of wealth and the laws of value and distribution (rent, wages, interest, and profits) are made the chief object of study. The course combines theoretical principles with their application in the public problems of State and nation. It will be found of value by everyone who desires to understand the chief issues of the day, and especially helpful to teachers of history and government. The following texts are used in the course: Lansing, *Principles of Economics*, 2 Vols., revised edition (The Macmillan Company, New York, $4.00); Marshall, Wright and Field, *Materials for the Study of Elementary Economics* (University of Chicago Press, Chicago, Ill., $2.75); Day and Davis, *Questions on the Principles of Economics* (The Macmillan Company, New York, 50 cents).

1(f). Principles of Economics.

The first term's work in economics lays the foundation for the whole course. In it are considered the chief forces which work in the industrial world of today, and the foundations of prices—utility and cost production. The laws of consumption and production are studied.

One-third college credit. Equivalent to the fall term of Economics 1.

Mr. Wolfe.

1(w). Principles of Economics.

A continuation of Economics 1(f). In this course the chief topics are value and price, monopoly prices, money and banking, international trade, and tariffs.

One-third college credit. Equivalent to the winter term of Economics 1.

Mr. Wolfe.

1(s). Principles of Economics.

This is a continuation of Economics 1(w), special attention being paid to problems of industrial concentration, labor organization and socialism.

One-third college credit. Equivalent to the spring term of Economics 1.

Mr. Wolfe.

12(f). Money.

The nature of money and credit, the relation of money and credit to prices, the recent rise in prices, and an historical and analytical study of the monetary system of the United States are some of the topics studied in this course.

Texts: J. F. Johnson's "*Money and Currency*" (Ginn & Co., Boston; price, $1.75); C. A. Phillips, *Readings in Money and Banking* (The Macmillan Co., New York; price, $2.10).

Prerequisite: Economics 1.

One-third college credit. Equivalent to the fall term of Economics 12.

Mr. Miller.

12(w). Banking.

The principles of banking and the history of the banking systems of the leading countries, with special emphasis upon the system in the United States, are studied.

Texts: J. T. Holdsworth's "*Money and Banking*" (D. Appleton & Co., New York; price, $2.00); C. F. Dunbar's "*Theory and History of Banking*" (G. P. Putnam's Sons, New York; price, $1.25).

Prerequisite: Economics 1.

One-third college credit. Equivalent to the winter term of Economics 12.

Mr. Miller.

12(s) Financial Crises.

Theories of the causes of financial crises, and the phenomena of the more important crises of the nineteenth century are studied.

Texts: Theodore Burton's "*Financial Crises*" (D. Appleton & Co., New York; price, $1.40); O. M. W. Sprague's "*History of Crises under the National Banking System*" (Superintendent of Public Documents, Washington, D. C.).

Prerequisite: Economics 1.

One-third college credit. Equivalent to the spring term of Economics 12.

Mr. Miller.

Principles of Economics for Professional Students

Students in law and engineering who for good reasons cannot take this required course during the regular academic year may take it by correspondence. The number who can be allowed to do this course at any one time, however, is strictly limited. Except in rare instances, students will not be permitted to take all three terms of this course by correspondence. The textbooks required will be Taussig's "*Principles of Economics*," revised edition, 2 vols. (The Macmillian Company, New York; price, $4.00); Marshall, Wright and Field's

The Materials for the Study of Elementary Economics (University of Chicago Press, Chicago; price, $2.75); and Day and Davis's *Questions on the Principles of Economics* (The Macmillan Company, New York; price, 50 cents).

6(f). Economics for Professional Students.

The first term's work covers production, money, and part of the discussion of banking, chapters 1-26 of Taussig, and the appropriate collateral reading and problems.

One-third college credit. Equivalent to the fall term of Economics 6.

Mr. Wolfe.

6(w). Economics for Professional Students.

The second term completes the subject of banking, international exchange and trade, interest, land rent, and part of the discussion of wages, chapters 27-48 of Taussig and collateral reading and problems.

One-third college credit. Equivalent to the winter term of Economics 6.

Mr. Wolfe.

6(s). Economics for Professional Students.

The third term covers wages, population, labor problems, industrial corporations and trusts, railway problems, taxation, social reform, chapters 49-70 of Taussig, etc.

One-third college credit. Equivalent to the spring term of Economics 6.

Mr. Wolfe.

Outline of Sociology

A general survey of present-day sociological thought with regard to social forces, social organization, social control, and social progress. The processes of socialization and social control receive attention. This involves a consideration of such matters as custom, tradition, convention, public sentiment, law, etc. The fundamental psychophysical relation between the individual and society is discussed with some care, and the significance of imitation, emulation, suggestion, crowd psychology, prestige, impression, etc., is pointed out. Social ideals of an ethical nature are next examined with reference to concrete situations. These include the ideals of competition and social conflict and militarism, of equality and inequality, democracy and justice, and of aristocracy. Finally some attention will be given to social pathology—the causes and treatment of poverty, mental defect, crime, and racial deterioration. The main object of the course is to give the student something of a scientific background for the consideration of concrete social problems.

This entire course is equivalent to Economics 15, but it will be given by correspondence in consecutive thirds as announced below.

15(f). Outlines of Sociology.

Social evolution; socialization.

Blackmar and Gillin, Parts 1-3, inclusive; Cooley, *Social Organization.*

One-third college credit. Equivalent to the fall term of Economics 15.

Mr. Wolfe.

15(w). Outlines of Sociology.

Social control; social ideals.

Blackmar and Gillin, Part 4, Giddings, *Readings in Descriptive and Historical Sociology*, Wallas, *The Great Society*, Ross, *Social Psychology.*

One-third college credit. Equivalent to the winter term of Economics 15.

Mr. Wolfe.

15(s). Outlines of Sociology.

Social pathology; social cooperation.

Blackmar and Gillin, Part 5, Ross, *Social Control*, Wallas, *The Great Society*, Giddings, *Readings in Descriptive and Historical Sociology.*

One-third college credit. Equivalent to the spring term of Economics 15.

Mr. Wolfe.

117f. Socialsm.

A course dealing in outline with the essential economic and social principles of socialism as developed and expressed in modern socialist literature. Types of socialistic thought, historically considered. History of socialistic movements, and the status of socialism at present in the chief countries. Socialist ideals critically examined. The texts used will be Spargo and Arner's *Elements of Socialism* (The Macmillan Company, New York; price, $1.50); Kirkup's *History of Socialism*, 5th edition (The Macmillan Company, New York; price, $2.25); and Skelton's *Critical Examination of Socialism* (Houghton, Mifflin & Company, Boston; price, $1.50). Walling and others, *The Socialism of Today* (Henry Holt Co., New York; price, $1.75). In addition a number of inexpensive socialistic pamphlets will be required.

Prerequisite: Economics 1 or Economics 6, or their equivalent.

One-third college credit. Equivalent to Economics 117f.

Mr. Wolfe.

214ws(w). The Labor Prolem.

The problems of both organized and unorganized labor are dealt with in this course, with emphasis upon the situation in this country.

Occasional reference will be made to the conditions in other countries. Strikes and boycotts, conciliation and arbitration are among the leading topics. Each student is expected to provide himself with Adams and Sumner, *Labor Problems* (Macmillan Co., New York; price, $1.75); Carlton, *History and Problems of Organized Labor* (D. C. Heath and Co., Chicago; price, $2.23).

One-third college credit. Equivalent to the winter term of Economics 214ws.

MR. GREGG.

214ws(s). THE LABOR PROBLEM.

This is a continuation of Economics 214ws(w).

One-third college credit. Equivalent to the spring term of Economics 214ws.

MR. GREGG.

ENGLISH

1(f). ENGLISH COMPOSITION.

This course involves (*a*) a study of the rhetoric of the whole essay, of the paragraph, and of the sentence; (*b*) the analysis of certain masterpieces of English prose, mainly the essays of Macaulay; and (*c*) abundant practice in writing. As in all other courses in English Composition in the University, chief stress will be laid on the written work; and each essay will be carefully corrected and returned to the student ,with such comments as seem most likely to be helpful. Punctuation will receive special emphasis throughout this course. The texts used will be Canby and Others, *English Composition in Theory and Practice* (Macmillan Co., New York; price, $1.25); Woolley, *The Mechanics of Writing* (Heath & Co., Boston; price, $1.12); Scott & Zeitlin, *College Readings in English Prose* (Macmillan Co., New York; price, $1.40); *Select Essays of Macaulay* (edited by Samuel Thurber: Allyn & Bacon, Chicago; price, 50 cents). Parallel reading will be required.

One-third college credit. Equivalent to the fall term of English 1.

MISS AYNESWORTH.

1(w). ENGLISH COMPOSITION.

This course involves (*a*) a study of the rhetoric of words and figures, and of exposition and argumentation; (*b*) the analysis of certain English prose masterpieces, mainly expository and argumentative; and (*c*) abundant practice in writing. The texts used will be Canby and Others, *English Composition in Theory and Practice* (Macmillan Co., New York; price, $1.25); Scott & Zeitlin, *College Readings in English Prose* (Macmillan Co., New York; price, $1.40); *Essays of Robert Louis Stevenson* (edited by W. L. Phelps: Charles Scribner's Sons, New York; price, 75 cents). Parallel reading will be required.

The course is a continuation of English 1(f), and no student who has not had that work or its equivalent will be admitted to this course without the consent of the instructor in charge.

One-third college credit. Equivalent to the winter term of English 1.

MISS AYNESWORTH.

1(s). ENGLISH COMPOSITION.

This course involves (*a*) a study of the rhetoric of narration and description; (*b*) the analysis of certain English prose masterpieces, mainly narrative and descriptive; and (*c*) abundant practice in writing. The texts used will be Canby and Others, *English Composition in Theory and Practice* (Macmillan Co., New York; price, $1.25); Scott & Zeitlin, *College Readings in English Prose* (Macmillan Co., New York; price, $1.40); Hawthorne, *The House of the Seven Gables* (Lake Classics, Scott, Foresman & Co., New York, Chicago; price, 35 cents); Sherman, *A Book of Short Stories* (Henry Holt & Co., New York; price, 50 cents). Parallel reading will be required.

This course is a continuation of English 1(w), and no student who has not had that work or its equivalent will be admitted to this course without the consent of the instructor in charge.

One-third college credit. Equivalent to the spring term of English 1.

MISS AYNESWORTH.

2(f). ENGLISH LITERATURE FROM CAEDMON TO SHAKESPEARE.

The aim of this course is to give the student a general view of the history and development of English literature from Caedmon to Shakespeare. A textbook presenting the literary history of the period will be used, but most of the time will be devoted to a first-hand study of representative works of the authors dealt with. Parallel reading and essays will be required. Works of the Old English and of the Middle English periods will be studied in translations or in modernized versions. The following textbooks will be used: Bronson's *English Poems*, Vols. I and II (University of Chicago Press, price, $1.00 each); Crawshaw's *The Making of English Literature*, chapters I-VIII (D. C. Heath and Co., Boston; price, $1.30); *Beowulf* (translated by C. G. Child: Houghton, Mifflin and Co., Boston; price, 16 cents); Cook and Tinker's *Translations from Old English Poetry* (Ginn and Co., Boston; price, $1.00); Greenlaw's *Selections from Chaucer* (Scott, Foresman, and Co., Chicago; price, 40 cents).

Prerequisite: English 1.

One-third college credit. Equivalent to the fall term of English 2.

MR. GRIFFITH.

2(w). English Literature from Shakespeare to Thomson.

This is a continuation of English 2(f) and will be similarly conducted. The following textbooks will be used: Bronson's *English Poems*, Vol. II, p. 110 to the end, and Vol. III, pp. 1-165 (University of Chicago Press; price, $1.00 each); Manly's *English Prose* (Ginn and Co., Boston; price, $1.50); Crawshaw's *The Making of English Literature*, chapters IX-XI (D. C. Heath and Co., Boston; price, $1.30); Thayer's *Best Elizabethan Plays* (Ginn and Co., Boston; price, $1.25); Shakespeare's *Henry IV, First Part* (edited by F. W. Moorman: D. C. Heath and Co., Boston; price, 30 cents); Shakespeare's *Macbeth* (edited by E. K. Chambers: D. C. Heath and Co., Boston; price, 30 cents); Shakespeare's *Twelfth Night* (edited by A. D. Innes: D. C. Heath and Co., Boston; price, 30 cents).

Prerequisite: English 2(f).

One-third college credit. Equivalent to the winter term of English 2.

Mr. Griffith.

2(s). English Literature from Thomson to Tennyson.

This is a continuation of English 2(w). The following textbooks will be used: Bronson's *English Poems*, Vol. III, pp. 166 to the end, and Vol. IV (University of Chicago Press; price, $1.00 each); Crawshaw's *The Making of English Literature*, chapter XII to the end (D. C. Heath and Co., Boston; price, $1.30); and either Manly's *English Prose* (Ginn and Co., Boston; price, $1.50) or Makower and Blackwell's *English Essays* (Oxford University Press, American Branch, New York; price, 60 cents).

Prerequisite: English 2(w).

One-third college credit. Equivalent to the spring term of English 2.

Mr. Thompson.

3(f). Advanced English Composition.

This course involves (*a*) a study of rhetorical principles; (*b*) the analysis of certain masterpieces of English prose by way of illustrating these principles; and (*c*) the writing of a number of essays. Chief stress will be laid upon the written work; and each essay will be carefully corrected and returned to the student. The texts used will be Genung's *The Working Principles of Rhetoric*, pp. 1-106, 356-474 (Ginn and Co., Boston; price, $1.40); *Specimens of Exposition* (edited by Hammond Lamont: Holt and Co., New York; price, 60 cents); and *Selected Essays of Charles Lamb*, pp. 1-103 (edited by G. A. Wauchope: Ginn and Co., Boston; price, 50 cents).

Prerequisite: English 1.

One-third college credit. Equivalent to the fall term of English 3.

Mr. Wharey.

3(w). Advanced English Composition.

English 3(w) is a continuation of English 3(f). As in English 3(f), the work will consist of (*a*) a study of rhetorical principles, (*b*) the analysis of certain masterpieces of English prose illustrative of these principles, and (*c*) the writing of a number of essays. In the latter part of the course, the simpler forms of narration will be studied. The texts used will be Genung's *The Working Principles of Rhetoric* (Ginn and Co., Boston; price, $1.40); *Selected Essays of Charles Lamb* (edited by G. A. Wauchope: Ginn and Co., Boston; price, 50 cents); *Specimens of Narration* (edited by William T. Brewster: Holt and Co., New York; price, 60 cents).

Prerequisite: English 3(f).

One-third college credit. Equivalent to the winter term of English 3.

Mr. Wharey.

3(s). Advanced English Composition.

This course will continue the study of Narration begun in English 3(w), and will also take up the study of Description. Particular emphasis will be laid upon the short story as a form of art. Specimens of the best short stories will be carefully studied, and the student will be asked to write a number of narrative themes. The texts used will be *The Short-Story: Specimens Illustrating Its Development* (edited by Brander Matthews: American Book Co., New York; price, $1.00); Bliss Perry's *A Study of Prose Fiction* (Houghton, Mifflin, and Co., Boston; price, $1.25); and *Specimen of Prose Description* (edited by Charles Sears Baldwin: Holt and Co., New York; price, 60 cents).

Prerequisite: English 3(w).

One-third college credit. Equivalent to the spring term of English 3.

Mr. Wharey.

English 230fw(*f*). Victorian Prose. Advanced.

This course will be an intensive study of the chief prose writers of the Victorian Age, exclusive of the writers of fiction. In the first term the prose of Macaulay, Carlyle and Ruskin will be studied. In addition to the class texts, which will be edited selections from the separate authors, the student should have access to such general reference books as Minto's *A Manual of Prose Literature;* Clark's *A Study of English Prose Writers;* Walker's *Literature of the Victorian Era;* Saintbury's *History of English Prose Rhythm*, etc.

Prerequisite: English 1 and 2.

One-third college credit.

Mr. Payne.

ENGLISH 230fw(w). VICTORIAN PROSE. ADVANCED.

In the second half of the course on Victorian Prose, the chief authors treated will be Matthew Arnold, Cardinal Newman, Walter Pater, and R. L. Stevenson. The general reference books will be the same as those used in the first half.

Prerequisite: English 230fw(f).

One-third college credit.

MR. PAYNE.

FRENCH.

The courses below may be counted in the University either to absolve admission requirements or as degree courses. These courses will prove especially profitable to students who have some knowledge of a foreign language, preferably Latin, and who are acquainted with the technical terms and the arrangement of a grammar dealing with a foreign language. Students who have completed French A or who offer two admission units in high-school French will be admitted to French 1. The textbooks will vary from time to time. The titles below are given chiefly to enable the student to form some idea of the scope of the work. A course will consist of from twenty to thirty short lessons.

A(f). ELEMENTARY FRENCH FOR MEN IN MILITARY SERVICE.

In a series of twenty lesson-assignments, this course offers the essentials of French pronunciation and grammar, with practice in the use of the commonest terms and expressions of every-day civil and military life. Its nature is wholly practical. It aims to render a soldier in any branch of the service capable of understanding simple French and of expressing himself in a comprehensible manner in the situation with which he is most likely to be confronted in France.

An instructor will be provided for two oral lessons in pronunciation, whenever a registration of twenty applicants is made from the same camp. Notice of such oral instruction will be sent each student.

MR. BOND.

A(f). BEGINNER'S FRENCH.

This is an elementary course in reading and composition.

Text: Chardenal's *Complete French Course.*

One-third college credit. Equivalent to the fall term of French A.

MR. BOND.

A(w). BEGINNER'S FRENCH.

A continuation of French A(f), which is prerequisite.

Chardenal's *Complete French Course.*

One-third college credit. Equivalent to the winter term of French A

MR. BOND.

A(s). Beginner's French.

A continuation of French A(w), which is prerequisite.

Chardenal's *"Complete French Course"*; Bruno: *"Le Tour de la France"*; Daudet: *"Le Petit Chose."*

One-third college credit. Equivalent to the spring term of French A.

Mr. Bond.

Note.—The admission requirement of two units in French is represented by French A(f), (w), and (s), and 1(f).

1(f). Second-Year French.

This is a second-year course in French. French A or its equivalent is prerequisite.

Texts: Fraser and Squair's *French Grammar;* Buffum's *French Short Stories.*

One-third college credit. Equivalent to the fall term of French 1.

Mr. Bond.

1(w). Second-Year French.

A continuation of French 1(f).

Textbooks: Fraser and Squair's *French Grammar;* Sand's *La Mare au Diable;* France's *Le Crime de Sylvestre Bonnard.*

One-third college credit. Equivalent to the winter term of French 1.

Mr. Bond.

1(s). Second-Year French.

A continuation of French 1(f) and (w).

Textbooks: Fraser and Squair's *French Grammar;* Michelet's *Histoire de France;* Lemaitre's *Morceaux Choisis.*

One-third college credit. Equivalent to the spring term of French 1.

Mr. Bond.

2(f). French Literature of the Nineteenth Century.

This course follows the successful completion of French 1 or its equivalent. The purpose is to acquaint the student with the history of nineteenth century French literature, and with some representative works in French fiction, history, poetry, and essay. Composition will be required.

Texts used throughout the year: Fraser and Squair's *Complete French Course* (D. C. Heath & Co., Boston); some standard dictionary, as Edgren-Burnett (Henry Holt & Co., New York; price, $1.50), or *Le Petit Dictionnaire Larousse* (can be ordered from G. Stechert, New York; price, about $1.50).

Special texts for French 2(f): Chateaubriand, *Atala, René, Le Dernier des Abencerrages,* Michelet: *"Histoire de France"* (D. C.

Heath and Co., Boston); Victor Hugo, *Ruy Blas* (Henry Holt & Co., New York); *Composition* as above.

One-third college credit. Equivalent to the fall term of French 2.

MR. BOND.

2(w). FRENCH LITERATURE OF THE NINETEENTH CENTURY.

A continuation of French 2(f), which is prerequisite.

Texts: Balzac, *Eugénie Grandet* (Henry Holt & Co., New York); *Tales from Coppée and Maupassant* (Henry Holt & Co., New York); Dumas fils, *La Question d'Argent* (D. C. Heath & C., Boston); Rostand: *"Cyrano de Bergerac"* (Holt & Co., New York); *Composition* as above.

One-third college credit. Equivalent to the winter term of French 2.

MR. BOND.

2(s). FRENCH LITERATURE OF THE NINETEENTH CENTURY.

A continuation of French 2(w), which is prerequisite.

Texts: *Quelques Contes des Romanciers Naturalistes* (D. C. Heath & Co., Boston); Berthon: *"Specimens of Modern French Verses"* (The Macmillan Co., New York); Sainte-Beuve, *Seven of the Causeries du Lundi* (Henry Holt & Co., New York); Bazin: *"Les Oberlé"* (Henry Holt & Co., New York); Renan: *"Ma Soeur Henriette"* (Holt & Co., New York); *Composition* as above.

These texts may be varied from time to time.

One-third college credit. Equivalent to the spring term of French 2.

MR. BOND.

GEOLOGY

120f. PHYSIOGRAPHY.

Textbooks: Tarr and Martin's *College Physiography* (The Macmillan Co.; price, $3.75); Simond's *Geography of Texas: Physical and Political* (Ginn & Co.; price, 90 cents).

This course, known as Geology 120f, is equivalent to that given in the fall term of the freshman year and is, therefore, an *elementary* course. It is, however, of general interest to all students and will be of material assistance to those preparing themselves for teaching positions in high schools or colleges. The ground covered will include twelve chapters of the *College Physiography* and fourteen chapters of the *Geography of Texas.*

One-third college credit. Equivalent to Geology 120f.

MR. SIMONDS.

121w. PHYSIOGRAPHY.

A continuation of the preceding course. The ground covered is Tarr and Martin's *College Physiography*, beginning with Chapter XIII.

Prerequisite: Geology 120f.

One-third college credit. Equivalent to Geology 121w.

MR. SIMONDS.

A. Elements of Geography.

Textbooks: Salisbury, Barrows, and Tower's *Elements of Geography* (Holt & Co.; price, $1.60), American Science Series, and Simond's *Geography of Texas: Physical and Political.*

In this course "geographic influences" as affecting human affairs will be emphasized. The instruction is intended specially for teachers and others who desire to familiarize themselves with the relations of physiography to geography. Ten lessons.

One-half unit admission credit.

Mr. Simonds.

GERMAN

A(f). Beginner's German.

This course is based on the phonetic method, this method being used to teach the proper pronunciation. Grammatical inflection, declension, pronominal adjectives, and the essentials of strong and weak declensions are covered. About fifteen lessons of the textbook are used. The text is Prokosch's *Introduction to German* (Holt & Co., New York; price, $1.15). Ten lessons.

One-third college credit. Equivalent to the fall term of German A.

Mr. Wupperman.

A(w). Beginner's German.

This course is a continuation of German A(f). Stress is laid on proper pronunciation, based on phonetic script, and on the proper way to read. Lessons 16 to 28 of the textbook are covered, with emphasis on such principles as the use of the different tenses; the modal auxiliaries. Ten lessons.

One-third college credit. Equivalent to the winter term of German A.

Mr. Wupperman.

A(s). Beginner's German.

This course is a continuation of German A(w). The study of proper pronunciation and reading is continued. The study of the essentials of grammar is completed, and a thorough review of German grammar is offered. The reading of easy, idiomatic prose is also introduced. In addition to the regular textbook, Prokosch's *Deutsches Lese und Uebungsbuch* (Holt & Co., New York; price, 60 cents) is used in this term's work. Ten lessons.

One-third college credit. Equivalent to the spring term of German A.

Mr. Wupperman.

Note.—The admission requirements of two units in German is represented by German A(f), (w), and (s), and German 1(f).

1(f). Second-Year German.

This course follows the successful completion of German A(s); or it may be taken by students who have had two years of approved high-school German, or possibly, by special permission, by students who have done more irregular work in German, if they are able, upon examination, to convince the instructor of their fitness to pursue this course with profit to themselves. The text-books of this course are Prokosch, *Introduction to German* (Holt & Co., New York; price, $1.15); *German Dictionary* (D. C. Heath & Co., New York; price, $1.50); Boezinger *Mundliche und schriftliche Uebungen* (Holt & Co., New York; price, 75 cents); Storm's *Immensee* (Editor Elmer and Neumarker, Chas. E. Merrill Co., New York; price, 40 cents). Ten lessons.

One-third college credit. Equivalent to the fall term of German 1.

Mr. Wupperman

1(w). Second-Year German.

This course is a continuation of German 1(f), which is prerequisite. The same text-books that are used in German 1(f) are used in this course; also Boezinger's *Mundliche und schriftliche Uebungen* and, in place of *Immensee*, Frenssen's *Peter Moor* (edition Babson: Holt & Co., New York; price, 80 cents). Ten lessons.

One-third college credit. Equivalent to the winter term of German 1.

Mr. Wupperman.

1(s). Second-Year German.

This course is a continuation of the work of 1(w), which is prerequisite. More grammar review is given and the rapid reading of interesting short stories is begun in this term's work. The same grammar and dictionary that are used in 1(f) are used in this course; also Stern's *Die Wiedertaufer* (edition F. B. Sturm: Heath & Co., New York; price, 45 cents). Ten lessons.

One-third college credit. Equivalent to the spring term of German 1.

Mr. Wupperman.

2(f). German Reading and Composition.

This course, which follows the successful completion of German 1(s), contemplates giving the student practice in rapid reading, and, incidently, some knowledge of the more important developments in German literature, greater facility in written expression, and a review of the essentials of grammar and syntax. The same grammar and dictionary that are used in 1(f) are used in this course; also Pope's *German Composition* (Holt & Co., New York; price, 90 cents), and Schiller, *Das Lied von der Glocke* (edition Chas. P. Otis: Holt & Co., New York; price, 20 cents); Meyer, *Gustav Adolf's Page* (edition

Otto Heller: Heath & Co., New York; price, 30 cents). Ten lessons.

Prerequisite: German A and 1.

One-third college credit. Equivalent to the fall term of German 2.

MR. WUPPERMAN.

2(w). GERMAN READING AND COMPOSITION.

This course is a continuation of German 2(f). The same grammar and dictionary that are used above are also used in this course, and in addition Pope's *German Composition*, and Gottfried Keller, *Romeo und Julia auf dem Dorfe*, edition Corvin: (Holt & Co., New York; price, 40 cents). Ten lessons.

Prerequisite: German 2(f).

One-third college credit. Equivalent to the winter term of German 2.

MR. WUPPERMAN.

2(s). GERMAN READING AND COMPOSITION.

This course is a continuation of German 2(w). The grammar and dictionary that are used in this course are the same that are used in German 1; in addition Pope's *German Composition* and Hebbel, *Agnes Bernauer* (edition von Klenze, Oxford University Press, New York). Ten lessons.

Prerequisite: German 2(w).

One-third college credit. Equivalent to the spring term of German 2.

MR. WUPPERMAN.

220a. ADVANCED GERMAN COMPOSITION AND SYNTAX.

This course is designed to follow the successful completion of German 2(s). The fundamental principles of syntax and the element of style will be thoroughly treated in connection with original essays in German. The course should prove particularly helpful to all those who contemplate teaching German. Textbook: Some standard dictionary. Ten lessons.

Prerequisite: German 2.

One-third college credit. Equivalent to the first half of German 220.

MR. WUPPERMAN.

220b. ADVANCED GERMAN COMPOSITION AND SYNTAX.

This course is in every respect like 220a, except that it is more advanced.

Prerequisite: 220a.

One-third college credit. Equivalent to the second half of German 220.

MR. WUPPERMAN.

120.

Grammar. A thorough review of German grammar, helpful to those who intend to become teachers of German.

Prerequisite: German 2 or 22.

Text: Bishop & McKinley, *Deutsch Grammattik.*

One-third college credit.

MR. WUPPERMAN.

11(f).

An outline history of German literature from the beginning to the present time. For students who have access to a library.

Prerequisite: German 2 or 22.

One-third college credit.

MR. WUPPERMAN.

11(w).

A continuation of German 11(f), which is prerequisite.

One-third college credit.

MR. WUPPERMAN.

11(s).

A continuation of German 11(w), which is prerequisite.

One-third college credit.

MR. WUPPERMAN.

18(f).

This is a literary course for advanced students, giving a short review of the German literature of the nineteenth century. The textbook used is Kummer's *Deutsche Litteraturgeschichte des 19ten Jahrhunderts.* Besides, a number of books, which may be borrowed from the University Library or purchased in cheap editions, will be read. The names of the editions will be furnished upon application. Ten lessons.

Prerequisite: German 11.

One-third college credit. Equivalent to the fall term of German 18.

MR. WUPPERMAN.

18(w).

This course is a continuation of German 18(f), which is prerequisite. Ten lessons.

One-third college credit. Equivalent to the winter term of German 18.

MR. WUPPERMAN.

18(s).

This course is a continuation of German 18(w), which is prerequisite. Ten lessons.

One-third college credit. Equivalent to the spring term of German 18.

MR. WUPPERMAN.

12(f).

Modern German drama and lyrics. A literary course for advanced students who have access to some library. Ten lessons.

One-third college credit. Equivalent to the fall term of German 12.

Prerequisite: German 11.

MR. WUPPERMAN.

12(w).

This course is a continuation of German 12(f), which is prerequisite. Ten lessons.

One-third college credit. Equivalent to the winter term of German 12.

MR. WUPPERMAN.

12(s).

This course is a continuation of German 12(w), which is prerequisite. Ten lessons.

One-third college credit. Equivalent to the spring term of German 12.

MR. WUPPERMAN.

14(f).

The German Novel. A study of the development of the novel, with particular stress on the works of the nineteenth century novelists.

Prerequisite: German 11.

One-third college credit.

MR. WUPPERMAN.

14(w).

A continuation of German 14(f), which is prerequisite.

One-third college credit.

MR. WUPPERMAN.

14(s).

A continuation of German 14(w), which is prerequisite.

One-third college credit.

MR. WUPPERMAN.

8(f). SCHILLER.

Intimate study of the life of Schiller and of contemporaneous German literature. Careful reading and critical analysis of *Don Carlos;* interpretative reading of *Die Räuber* and *Kabale und Liebe.* Twenty lessons.

Biography and criticism. Texts: Calvin Thomas's *The Life and Works of Schiller* (H. Holt and Co., New York; price, $1.50); *Aus deutschen Lesebüchern,* Vol. 5, II, B. G. Teubner, *Schiller's Dramen,* Bellermann, 2 vols., Weidmann, Berlin; *Schiller,* Bellermann; Selman's *Verlag.*

Prerequisite: German 2.

NOTE.—Books on biography and criticism may be borrowed from the University library.

One-third college credit. Equivalent to the fall term of German 8.

MR. WUPPERMAN.

8(w). Schiller.

This course is a continuation of German 8(f) and is similar to it in character. Critical study of *Maria Stuart;* interpretative reading of *Die Jungfrau von Orleans* and *Wilhelm Tell.* Twenty lessons.

Biography and criticism as under 8(f).

One-third college credit. Equivalent to the winter term of German 8.

Mr. Wupperman.

8(s). Schiller.

This course is a continuation of German 8(w) and is similar to it in character. Critical study of *Wallenstein;* interpretative reading of Schiller's philosophic lyrics, reading of some of his better known ballads, *Das Lied von der Glocke,* and *Der Dreissigjährige Krieg.* Twenty lessons.

Biography and criticism as under 8(f).

One-third college credit. Equivalent to the spring term of German 8.

Mr. Wupperman.

136. Teacher's Course in German.

A study of German pronunciation and grammar from the standpoint of the teacher; discussion of methods of teaching German, preparation of practice lessons and courses of study, and criticism of textbooks. Texts: Bahlsen, *The Teaching of Modern Languages in Secondary Schools* (Ginn and Co., Boston; price, 80 cents); Prokosch, *German for Beginners* (Holt and Co., New York; price, $1.00); Vietor, *German Pronunciation* (Riesland, Leipzig; price, 50 cents).

Prerequisite: German 2 and one course in Education.

One-third college credit. Equivalent to German 136.

Mr. Wupperman.

GOVERNMENT

Government 1 or Economics 1 is a degree requirement for all men students, and is recommended, though not compulsory, for women. Government 1 will be accepted in lieu of Government 4 for the law degree.

Government 1 requires no prerequisite of college work, but students registering for the course should be able to satisfy the requirements for admission to the University.

The terms of a continuous course may be taken in any order.

Courses Without College Credit

A. Advanced Civics.

This course includes a study of national, state, and local govern-

ment in the United States, special attention being given to state and local government in Texas. The course is designed to be useful to teachers of civics, to persons desiring entrance credit in civics, and to those preparing for state teachers' examinations.

Texts: Garner, *Government in the United States* (American Book Co., Dallas, $1.00); Beard, *American Citizenship* (Macmillan Co., New York; price, $1.12); Triplett and Hauslein, *Civics, Texas and Federal* (Rein and Sons Co., Houston, 75 cents).

No prerequisite. No college credit.

One-half unit admission credit in civics.

Mr. James and Mr. Barnes.

B. The American City.

A practical course adapted to the needs of those who wish to inform themselves regarding municipal affairs, without making the thorough comparative study involved in Government 15. The form and structure of American city government, including commission government and the city-manager plan, administrative organization and method, municipal finance and budget systems, municipal functions, with a first-hand examination of actual conditions in the community in which the student lives. Special attention is given to charter drafting, public health, the public utility problem, and city planning.

The course should appeal particularly to business and professional men, commercial secretaries and public officials; and is recommended also to women who want to make a well directed study of municipal affairs.

Texts: Munro, *The Government of American Cities*, new and revised edition (Macmillan Co., New York; price, $2.00); James, *Applied City Government* (Harper and Bros., New York; price, 75 cents); Zublin, *American Municipal Progress*, revised and enlarged edition (Macmillan Co., New York; price, $2.00).

No prerequisite. No college credit.

Mr. James and Mr. Paxton.

Courses with College Credit

1(f). The Governments of Europe.

This course presents a description of the governmental arrangements of England, Germany, France, and Switzerland.

Texts: Ogg, *The Governments of Europe* (Macmillan Co., New York; price, $3.00); Lowell, *The Government of England*, 2 volumes (Macmillan Co., New York; price, $4.00).

One-third college credit. Equivalent to the fall term of Government 1.

Mr. James and Mr. Barnes.

1(w). American Federal Government.

This course traces the development of American political institutions and presents an analysis of the present system of federal government in the United States.

Texts: Beard, *American Government and Politics* (Macmillan Co., New York; price, $2.25); Beard, *Readings in American Government and Politics* (Macmillan Co., New York; price, $2.00); Young, *The New American Government and Its Work* (Macmillan Co., New York; price, $2.25).

One-third college credit. Equivalent to the winter term of Government 1.

Mr. James and Mr. Barnes.

1(s). American State Government.

This course presents an analysis of typical state constitutions, a description of the departments of state government, a consideration of the relation of the state to local and municipal institutions and to political parties, and a survey of state activity in relation to business, labor, education, health, charities and corrections, and highways and finances.

Texts: Beard, *American Government and Politics* (Macmillan Co., New York; price, $2.25); Beard, *Readings in American Government and Politics* (Macmillan Co., New York; price, $2.00); Young, *The New American Government and Its Work* (Macmillan Co., New York; price, $2.25).

One-third college credit. Equivalent to the spring term of Government 1.

Mr. James and Mr. Barnes.

15(f). American Municipal Government: Advanced.

The development of cities and city government, social structure of the city, relation to the state, municipal powers, and responsibilities, the electorate, elections, and politics, mayor and council, commission government, the city-manager plan, administrative departments and methods, direct legislation and the recall, reform movements, municipal finance, city charter making.

Texts: Munro, *The Government of American Cities*, new and revised edition (Macmillan Co., New York; price, $2.00); James, *Applied City Government* (Harper and Bros., New York; price, 75 cents); Beard, *American City Government* (Century Co., New York; price, $2.25).

Prerequisite: Government 1 or 4.

One-third college credit. Equivalent to the fall term of Government 15.

Mr. James and Mr. Paxton.

15(w). European Municipal Government: Advanced.

Europe's municipal history. The organization, functions and accomplishments of the cities of France, Prussia and England, with special reference to: the French system of communal administration, the Prussian burgemeister and the German administrative boards, the English borough, the Local Government Board, and the relation of the National government to the British city. Social activities of the German cities. Municipal ownership in Great Britain.

Texts: Munro, *The Government of European Cities* (Macmillan Co., New York; price, $2.00); Fairlie, *Municipal Administration* (Macmillan Co., New York; price, $3.00); Howe, *European Cities at Work* (Chas. Scribner's Sons, New York; price, $1.75).

Prerequisite: Government 1 or 4.

One-third college credit. Equivalent to the winter term of Government 15.

Mr. James and Mr. Paxton.

15(s). Municipal Functions and Administration: Advanced.

Police and fire protection; development and care of streets; water supply; sewage disposal, food and milk supply, sanitation and public health administration, abatement of nuisances, recreation and social welfare, public utilities, municipal finance, city planning. A large part of the course will be devoted to first-hand study of the community in which the student lives.

Texts: James, *Municipal Functions* (D. Appleton & Co., New York; price, $2.00); Zueblin, *American Municipal Progress*, revised and enlarged edition (Macmillan Co., New York; price, $2.00); Fairlie, *Municipal Administration* (Macmillan Co., New York; price, $3.00).

Prerequisite: Government 1 or 4.

One-third college credit. Equivalent to the spring term of Government 15.

Mr. James and Mr. Paxton.

GREEK

521(f). Beginner's Greek.

In this course the study of Greek is begun by the use of Goodell's *The Greek in English* (H. Holt and Co.). This completed, *Elementary Greek* by Burgess and Bonner, and *Elements of Greek* (Scott, Foresman and Co.) are taken up, with Moss's *Greek Reader* (Allyn and Bacon).

Equivalent to the fall term of Greek 521.

Mr. Lofberg.

521(w). Beginner's Greek.

This is a continuation of Greek 521(f). *Elementary Greek* by

Burgess and Bonner and Moss's *Greek Reader* will be used as textbooks.

Equivalent to the winter term of Greek 521.

MR. LOFBERG.

521(s). BEGINNER'S GREEK.

The Anabasis of Xenophon is taken up with Goodwin's Grammar. Equivalent to the spring term of Greek 521.

MR. LOFBERG.

NOTE.—Course 521(fws), equivalent to Greek 521 in the regular catalogue, go together as the work necessary to enter Freshman Greek (Greek 22). They may not be counted separately. Together they count either (1) as two admission credits plus one-third of a course toward the degree, or (2) as one and two-thirds courses toward the degree.

106. NEW TESTAMENT GREEK.

This is an elementary course in the reading of the New Testament. It presupposes such a knowledge of Attic Greek as would correspond to Greek 521(fws) described above. It is intended for those who would like to read the sacred books of Christianity in the original, unbiased by any ecclesiastical interpretation. Westcott and Hort's Text with Lexicon (The Macmillan Co., New York; price, $1.90) is used.

One-third college credit.

MR. LOFBERG.

NOTE.—Those desiring other work than that which is offered here are invited to correspond with Mr. Penick.

HISTORY

ANCIENT HISTORY

1(f). HISTORY OF GREECE.

The history of Greece from the earliest times to the death of Alexander. Texts: Bury's *History of Greece for Beginners* (The Macmillan Co., New York; price, 90 cents); Fling's *Source Book of Greek History* (D. C. Heath and Co., Boston; price, $1.12); Shepherd's *Atlas of Ancient History* (Henry Holt and Co., New York; price, 90 cents).

One-third college credit. Equivalent to the fall term of History 1.

MR. MARSH.

1(w). THE ROMAN REPUBLIC.

The Roman Republic from the earliest times to the Battle of Actium.

Texts: Pelham's *Outlines of Roman History* (G. P. Putnam's Sons, New York; price, $1.75); Abbott's *Roman Political Institutions* (Ginn and Co., Boston; price, $1.50); Shepherd's *Atlas of Ancient History* (Henry Holt and Co., New York; price, 90 cents).

One-third college credit. Equivalent to the winter term of History 1.

MR. MARSH.

1(s). THE ROMAN EMPIRE.

The Roman Empire from the Battle of Actium to the downfall of the Empire in the west. Texts: Pelham's *Outlines of Roman History* (G. P. Putnam's Sons, New York; price, $1.75); Jones's *The Roman Empire* (G. P. Putnam's Sons, New York; price, $1.50); Shepherd's *Atlas of Ancient History* (Henry Holt and Co., New York; price, 90 cents).

One-third college credit. Equivalent to the spring term of History 1.

MR. MARSH.

MEDIEVAL HISTORY

2(f). EARLY MIDDLE AGES, 395-814.

As far as the conditions of correspondence work will permit, this course, taken with History 2(w) and 2(s), aims to duplicate the work of History 2 as given in the long session. The three courses give a general survey of the history of Western Europe from the disintegration of the Roman Empire to the close of the Italian Renaissance. As the Middle Ages are the sources of our modern civilization, these courses form an excellent introduction to courses dealing with modern periods. The work is arranged so as to lay especial emphasis on the more elementary methods of studying history, and is thus an introduction to more advanced work in this subject. Unless good library facilities are available, it will be necessary for the student to purchase several reference books, the cost of which will be about $5.00.

One-third college credit. Equivalent to the fall term of History 2.

MR. GUTSCH.

2(w). THE FEUDAL AGE, 814-1300.

This course is a continuation of History 2(f).

One-third college credit. Equivalent to the winter term of History 2.

MR. GUTSCH.

2(s). THE LATER MIDDLE AGES, 1300-1450.

This course is a continuation of History 2(w).

One-third college credit. Equivalent to the spring term of History 2.

MR. GUTSCH.

ENGLISH HISTORY

4(f). HISTORY OF ENGLAND DURING THE MIDDLE AGES.

The work of this course will cover the period from the beginning of English History to 1509, and will consist of (*a*) ten lessons approximately equal in length, to be assigned in the textbook and the source book; (*b*) parallel readings along one of three optional lines suggested below; and (*c*) a term theme.

By means of the parallel readings an attempt is made to adapt the course to the special needs of the three following classes of students: (1) those who are preparing for the study of law or government; (2) those who are specializing in English language and literature; (3) those who are expecting to teach history or do advanced research work in history. Texts: A. D. Innes's *History of England for Use in Schools* (G. P. Putnam's Sons, New York; price, $1.25, postage, 13 cents). The source book is E. P. Cheyney's *Readings in English History* (Ginn and Co., Boston; price, $1.80, postage, 17 cents). These two books cover also the work of history 4(w) and 4(s). Books for parallel reading: (1) by those who are preparing for the study of law or government, A. B. White's *The Making of the English Constitution* (G. P. Putnam's Sons, New York; price, $2.00, postage, 18 cents); (2) by those who are specializing in the English language and literature, G. M. Trevelyan's *England in the Age of Wycliffe* (Longmans, Green and Co., London; price, $2.00, postage, 18 cents); (3) by those who are expecting to teach History or do research work, C. A. Beard's *Introduction to the English Historians* (The Macmillan Co., New York; price, $1.60, postage, 18 cents).

One-third college credit. Equivalent to the fall term of History 4.

MR. MANNING.

4(w). HISTORY OF ENGLAND, TUDOR AND STUART PERIOD:, 1485-1714.

The method of instruction will be practically the same as in History 4(f). The books required for parallel reading will be indicated by correspondence. The amount and the character of the reading and the cost of the books will not differ greatly from those in 4(f).

One-third college credit. Equivalent to the winter term of History 4.

MR. MANNING.

4(s). HISTORY OF ENGLAND DURING THE LAST TWO CENTURIES.

The method of instruction will be practically the same as in History 4(f) and 4(w), and the amount and character of the reading and the cost of the books will differ little from that in 4(f).

One-third college credit. Equivalent to the spring term of History 4.

MR. MANNING.

American History

5(f). The American Colonies and the Revolution

The purpose of this course is not only to give the student a clear notion of the planting of the English colonies in the new world and of their development, but also to make clear to him their position in the British empire and their relations to the mother country. To this end considerable attention will be given to the nature of the colonial governments and charters, the trade policy and colonial administrative system of Great Britain, and the more fundamental causes of the American Revolution. In the Revolution itself, considerable attention will be paid to the organization of the government, the finances, conditions in the army, the loyalists, etc. This will be followed by a study of the conditions existing under the government of the Confederation and the formation of the Constitution.

Students with sophomore standing in the University or persons of some maturity may pursue this work with profit, but immature or poorly prepared students will not be admitted to the course.

The course will consist of ten lessons, each about equivalent to a week's work in one course at the University. The textbooks used are: Bassett's *Short History of the United States* (The Macmillan Co., New York, 1913; price, $2.50); A. B. Hart's *American History Told by Contemporaries*, Vols. I, II, and III (The Macmillan Co., New York; price, $2.00 each); Macdonald's *Documentary Source-book of American History, 1606-1898* (The Macmillan Co., New York; price, $1.75). It is possible that arrangements can be made for the Department of Extension to lend copies of some of these books to students.

One-third college credit. Equivalent to the fall term of History 5.

Mr. Ramsdell.

5(w). The United States from 1789 to 1860.

Special attention is given to the organization of the new government under the Constitution, foreign relations, to the establishment of a definite international status in 1823, the trend toward nationalism, the rise of the west and of a "national democracy," the diverging economic developments of North and South, the rise of sectional issues, especially slavery, the struggle of slavery and anti-slavery parties for the control of new territory, the compromise measures of 1850, the Kansas troubles, and the sectionalizing of political parties, to 1860.

The same conditions govern admission to this course as apply to History 5(f).

This course is covered in ten lessons. The textbooks used are: Bassett (as above); Hart's *Contemporaries*, Vols. III and IV; Macdonald (as above).

One-third college credit. Equivalent to the winter term of History 5.

Mr. Ramsdell.

5(s). The United States Since 1860.

This course begins with the election of 1860 and the secession of the cotton States. The Civil War will be studied not merely from the military point of view, but also with regard to the conditions—material, financial, political and diplomatic—North and South—under which it was waged. Particular attention will be given to the condition of the country at the close of the war and to the plans of reconstruction followed first by President Johnson and then by Congress, and their effect upon the South. An attempt will be made to present clearly the issues that have arisen since the close of Reconstruction—the silver question, civil service reform, the tariff, the war with Spain and "imperialism," the race problem, the controversies concerning trusts and monopolies, and the development of political parties.

The same conditions govern admission to this course as apply to History 5(f).

There are ten lessons. The texts used are Bassett (as above), Hart's *Contemporaries* (as above), Vol. IV; Macdonald (as above).

One-third college credit. Equivalent to the spring term of History 5.

Mr. Ramsdell.

HOME ECONOMICS

204(f). Hygiene in the Home.

This course considers the sanitary furnishing and fittings of the home. It deals specifically with the water supply, plumbing, sewers, removal and disposal of household waste, ventilation, lighting, heating, and other factors influencing the health of the family. The relation of household hygiene to public hygiene is carefully considered. Special emphasis is placed on the ethical and economic aspects of hygiene, and of the relation of the woman in the home to the problems of public health. Maria Elliott's *Household Hygiene* (American School of Home Economics, Chicago; price, $1.50) is used as a textbook in this course, and each student is expected to have a copy. Suggestive readings: Ogden, *Rural Hygiene* (Macmillan, New York; price, $1.50); Hollis Godfrey, *The Health of the City* (Houghton, Mifflin Co., Boston; price, $1.25); Osborne C., *The Family House* (Penn Pub. Co., Philadelphia; price, $1.00).

One-third college credit. Equivalent to the fall term of Home Economics 204.

Miss Gearing.

B. Food Preparation and Conservation.

This course is not intended for University credit, but is offered for those who wish to make a thorough study of the problem of feeding the family in the light of present conditions. Special stress will be laid on the marketing problem, the preparation and serving of local food products, and the use of wheat, meat and sugar sub-

stitutes. The course will also include a study of food values and body requirements, and the application of this knowledge in the planning of balanced menus for the family. Textbook: *Feeding the Family*, Mary Schwartz Rose (Macmillan Co., New York; price, $2.10). Suggested reading, *Food Products*, H. C. Sherman (Macmillan Co., New York). Free bulletins from Extension Department of University of Texas and United States Department of Agriculture. No credit.

MISS HEFLIN.

LATIN

COURSES FOR ADMISSION WITHOUT UNIVERSITY CREDIT

A. BEGINNER'S LATIN.

Textbook: *Beginning Latin* by Barss (D. C. Heath and Co., Boston; price, $1.00). This course is for those who have had no Latin, and covers half of the book.

MR. LOFBERG.

B. BEGINNER'S LATIN.

A continuation of Course A; the second half of the book will be completed.

MR. LOFBERG.

X. EASY LATIN PROSE COMPSITION.

Textbook: Bell's *Concise Latin Course* (The Macmillan Co., New York; price, 50 cents). This course follows B, and furnishes a thorough review of forms and words before beginning consecutive reading courses.

L. CAESAR.

De Bello Gallico (Book I). Any text.

MR. LOFBERG.

M. CAESAR.

De Bello Gallico (Books II and III). Any text.

MR. LOFBERG.

N. CICERO.

Pro lege Manilia. Any text.

MR. LOFBERG.

O. CICERO.

Two Orations Against Catiline. Any text.

MR. LOFBERG.

P. VERGIL.

The Aeneid (Book I). Any text.

Scansion and phrasing, as well as careful translation, will be taught

in this course. The school edition of the Gildersleeve-Lodge Grammar should be procured for reference.

No college credit

MR. LOFBERG.

NOTE.—The completion of the foregoing eight courses gives full University entrance in Latin, and counts as three admission units. Students who have already accomplished part of this work will be given credit upon satisfactory evidence that they can go on profitably with the remaining uncompleted parts.

COURSES WITH COLLEGE CREDIT

1(f). EASY LATIN READING COURSE.

Walford's *Extracts from Cicero* (Clarendon Press, New York; price, $1.10).

One-third college credit. Equivalent to the fall term of Latin 1.

MR. LOFBERG.

1(w). EASY LATIN READING COURSE.

Walford's *Extracts from Cicero.*

One-third college credit. Equivalent to the winter term of Latin 1.

MR. LOFBERG.

1(s). EASY LATIN READING COURSE.

Vergil, *The Aeneid* (Books II-IV). Any text.

One-third college credit. Equivalent to the spring term of Latin 1.

MR. LOFBERG.

102. LATIN PROSE COMPOSITION.

Textbook: Lavender's *Prose Composition, Part III* (University Co-operative Society, Austin. This course, if pursued with a high degree of efficiency, can be counted as a one-third course for the bachelor's degree; or if pursued with less success, will be counted as fulfilling the entrance requirement in prose composition.

MISS LAVENDER.

3(f). READING COURSE.

1. Cicero's *De Amicitia* (Bowen's edition: D. C. Heath, Chicago; price, 75 cents).

2. Sallust's *Catiline* (Penick: D. C. Heath, Chicago; price, $1.00).

One-third college credit. Equivalent to the fall term of Latin 3.

MR. LOFBERG.

3(s). READING COURSE.

Livy. Text: Cluer and Matheson (Clarendon Press, New York; price $1.25). One book, to be selected.

One-third college credit. Equivalent to the spring term of Latin 3.

MR. LOFBERG.

Courses 3(f) and 3(s) will cover the reading of the text, the interpretation of the text, a study of the life, the work, and the style of the author read, and such special grammar assignments as seem needed in each individual case.

104. LATIN PROSE COMPOSITION.

Text: Ritchie's *Easy Continuous Prose* (Longmans, Green & Co., New York; price, 85 cents).

This course follows Latin 102.

One-third college credit. Equivalent to Latin 104.

MISS LAVENDER.

NOTE.—If other courses are desired, each application will be acted upon as existing circumstances permit. Correspond with Mr. D. A. Penick.

PHILOSOPHY AND PSYCHOLOGY

PSYCHOLOGY

101f. ELEMENTARY PSYCHOLOGY.

This course takes up the general study of mental processes. Its object is to give a survey of the more important psychological facts, and to train the student to observe the processes in his own mind and in those of others, and to enable him to appreciate critically whatever he may read along psychological lines. It is introductory to all work in philosophy and psychology and is an important part of the equipment for all other fields of investigation.

One-third college credit. Equivalent to Psychology 101f.

MR. YARBROUGH.

117f. ADVANCED PSYCHOLOGY.

This course presupposes a familiarity with the subject-matter of psychology such as may be gained from course 101f or any equivalent period of careful study in the more recent introductory texts. It is a more critical consideration of the problems and methods of psychology together with a detailed presentation of certain special studies.

One-third college credit. Equivalent to Psychology 117f.

MR. HUNTER.

PHILOSOPHY

102f. INTRODUCTORY LOGIC.

In this course the principles which underlie valid reasoning will be studied. The text will be the third edition of J. E. Creighton's *Introductory Logic*.

One-third college credit. Equivalent to Philosophy 102w.

MR. BROGAN.

103s. Ethics.

Psychology 101f is advised as preliminary. The general object of the course is to give the student an appreciation of the moral situation. This includes (1) a definition of the moral problem, (2) an analysis of ethical theories and tendencies, and (3) a suggestion toward a method for dealing with the problems and theories in question.

One-third college credit. Equivalent to Philosophy 103s.

Mr. Brogan.

9(f). A. History of Philosophy.

In the fall term, the work will center on the study of the works of Plato. This may be taken alone as equivalent to Philosophy 9, fall term.

Prerequisite: One full course in Philosophy, or two-thirds of a course in Philosophy and Psychology 101f.

One-third advanced college credit.

Mr. Brogan.

9(w). A. History of Philosophy.

This is a continuation of 9f. It will trace the development of European and English Philosophy up to the time of Kant.

Prerequisite: Philosophy 9(f).

One-third advanced college credit.

Mr. Brogan.

9(s). A. History of Philosophy.

This course will begin with the philosophy of Kant, will then trace the development of thought in the nineteenth century, and will conclude with a short study of contemporary philosophies.

Prerequisite: Philosophy 9(w).

One-third advanced college credit.

Mr. Brogan.

PHYSICS

The lecture portion of Physics 1 may be taken by correspondence in three separate correspondence courses, comprising the fall, winter, and spring terms' work, respectively. The laboratory work will have to be done in residence, either during the summer session or the long session. Degree credit will be given only when both the laboratory and lecture work has been completed. Applicants should state which term's work they desire to take by correspondence.

Mr. Kuehne.

PUBLIC SPEAKING

208ws(w). Oratory.

This course will deal with the theory and practice of oral discourse; study of the oratorical style, with practice in the preparation of

different kinds of speeches and addresses. Textbook: *The Rhetoric of Oratory* (The University Cooperative Society, Austin; price, $1.10).

MR. SHURTER.

208ws(s). ORATORY.

This course will consist of the critical analysis of oratorical masterpieces, with study of notes thereon, and written outlines and reports. Text: *Masterpieces of Modern Oratory* (Ginn and Co., Dallas; price, $1.00).

Public Speaking 208ws(w) must accompany or precede 208ws(s).

One-third college credit. Equivalent to the spring term of Public Speaking 208ws.

MR. SHURTER.

210ws(w). DEBATE.

This course will consist in a study of the theory and principles of argumentation; the analysis of a proposition, use of evidence, kinds of arguments, methods of proof and refutation; together with some practice in brief-writing and argumentative composition. Textbook: *Science and Art of Debate* (Southwest Publishing Co., Austin; price, $1.35).

One-third college credit. Equivalent to the winter term of Public Speaking 210ws.

MR. SHURTER.

210ws(s). DEBATE.

A critical analysis of masterpieces in argumentation will be made in this course, the argument studied being carefully briefed. Text: *Masterpieces of Modern Oratory* (Ginn and Co., Dallas; price, $1.00).

Public Speaking 210ws(w) must precede or accompany 210ws(s),

One-third college credit. Equivalent to the spring term of Public Speaking 210ws.

MR. SHURTER.

11(f). ADVANCED ORATORY.

This course will consist of a study of the history of oratory and of oratorical literature in the Grecian and Roman periods. Written reports on collateral reading will be required. Texts: Sear's *History of Oratory* (Scott, Foresman and Co., Chicago; price, $1.50); Bryan's *World's Famous Orations* (Funk and Wagnalls, New York; price, $4.50).

Prerequisite: Two full courses in public speaking.

One-third college credit. Equivalent to the fall term of Public Speaking 11.

MR. SHURTER.

11(w). ADVANCED ORATORY.

This course will embrace a study of the oratory of the French

Revolution, of English Parliamentary oratory, and of American oratory of the Colonial period.

Course 11(f) must precede or accompany this course.

One-third college credit. Equivalent to the winter term of Public Speaking 11.

MR. SHURTER.

11(s). ADVANCED ORATORY.

In this course will be taken up a study of modern American oratory, with special reference to the oratory of the South.

Courses 11(f) and 11(w) must precede or accompany this course.

One-third college credit. Equivalent to the spring term of Public Speaking 11.

MR. SHURTER.

104f. ADVANCED DEBATE.

An intensive study of current public questions. Bibliographies, abstracts, briefs, and forensics.

One-third college credit. Equivalent to Public Speaking 104f.

MR. SHURTER.

PURE MATHEMATICS

Students who contemplate taking courses in mathematics in the Department of Extension should, if they desire college credit, select them with the following facts in mind:

1. All candidates for the A. B. degree are required to take one full college year of mathematics.
2. The minimum amount of mathematics required for entrance to the University is elementary algebra and plane geometry.
3. Students who present only this minimum can meet the mathematics requirement by taking Mathematics 1x, 1a, and 1c, or 1x, 1a, and 1b.
4. Students who present, in addition to the minimum, solid geometry also, should take Mathematics 1a, 1b, and 1c.
5. Students who present in addition to the minimum, both solid geometry and plane trigonometry, take Mathematics 1b, 1c, and 1d.

NOTE.—For courses in mathematics leading to State teacher's examinations, see pp. 83-85.

1(x). SOLID GEOMETRY.

This course will cover the matter usually covered in a course in solid geometry. An attempt will be made to instill sound ideas as to the nature of a geometrical proof. Attention will be called to the foundations upon which the science rests. Many original problems and numerical examples will be solved. Some of the applications of the subject will be pointed out. Ten lessons. Text: The Wentworth-

Smith *Solid Geometry* (Ginn and Co., Boston; mailing price, 85 cents).

This course may be counted as one-half unit toward admission requirements or one-third college credit.

MISS DECHERD.

1(a). PLANE TRIGONOMETRY.

This course will cover the subjects of trigonometric functions of angles, identities, solution of all sorts of triangles, inverse functions, trigonometric equations, circular measure, and logarithms. The arithmetic side of the subject will be emphasized. There will be much problem solving. Six lessons. Text: Wells's *Plane Trigonometry* (D. C. Heath and Co., Boston; mailing price, 80 cents).

This course may be counted as one-half unit toward admission requirements or one-third college credit.

MR. CALHOUN.

1(b). ADVANCED ALGEBRA.

This course will assume a knowledge of the matter usually covered by a good high-school course in algebra, but will treat some of the topics of such a course. Especial stress will be laid on quadratic equations and quadratic expressions, the graph, and complex numbers. The subjects of mathematical induction, determinants, logarithms, the binomial theorem, and kindred topics will be discussed. Ten lessons. Text: Hawkes's *Advanced Algebra* (Ginn and Co., Boston; mailing price, $1.52).

One-third college credit.

MR. CALHOUN.

1(c). INTRODUCTION TO ANALYTIC GEOMETRY.

This course will be devoted to a brief consideration of Cartesian co-ordinates, plotting curves from their equations, the analytic geometry of the straight line, the analytics of the circle, and a discussion of polar co-ordinates. Ten lessons. Text: Smith and Gale's *New Analytic Geometry* (Ginn and Co., Boston; mailing price, $1.35).

One-third college credit.

MISS DECHERD.

1(d). ANALYTIC GEOMETRY.

This course will consist of a hasty review of the straight line and the circle, followed by a consideration of the parabola, ellipse, and hyperbola. Ten lessons. Text: Smith and Gale's *New Analytic Geometry* (Ginn and Co., Boston; mailing price, $1.60).

One-third college credit.

Prerequisite: Mathematics 1c.

MISS DECHERD.

15(f). ANALYTIC GEOMETRY.

This course will treat, in the main, the same subjects as Mathe-

matics 1d, which is prerequisite to it, but will treat them more extensively as well as more intensively. An effort will be made to make some progress in a thorough and comprehensive study of the classic topics of analytic geometry. Text: Fine and Thompson's *Coördinate Geometry* (The Macmillan Co., New York; price, $1.60).

One-third college credit. Equivalent to the fall term of Mathematics 15.

MISS DECHERD.

15(w). ANALYTIC GEOMETRY.

This course is a continuation of Mathematics 15(f), the new subjects considered being the general equation of a conic, systems of conics, tangents and polars, equations and graphs of certain curves, and numerous loci problems. Text: Same as in Mathematics 15(f).

One-third college credit. Equivalent to the winter term of Mathematics 15.

MISS DECHERD.

15(s). ANALYTIC GEOMETRY OF SPACE.

This course is a continuation of the work of Mathematics 15(w), and the same text will be used.

One-third college credit. Equivalent to the spring term of Mathematics 15.

MISS DECHERD.

NOTE.—A good algebra is essential as a reference book for a student of Mathematics 15(f), 15(w), or 15(s). Hawkes's *Advanced Algebra* is recommended.

3(f). CALCULUS.

This and the following two terms of Mathematics 3 should be taken by all who have any interest in mathematics beyond the most elementary aspects of the subject, by teachers of high-school mathematics, by students of physics, and by those contemplating advanced work in chemistry, statistics, or life insurance.

In Mathematics 3(f) the topics treated are: Theory of limits, differentiation, tangent lines and normal lines, velocity, and acceleration, maxima and minima, such as greatest strength and least cost. Eight lessons. Text: Granville's *Elements of the Differential and Integral Calculus*, revised edition 1911 (Ginn and Co., Boston; price, $2.50).

Prerequisite: One term of analytic geometry. But students who have had only one term of analytic geometry are strongly urged to take a second term of analytic geometry along with the calculus.

One-third college credit. Equivalent to the fall term of Mathematics 3.

MR. SIMPSON.

3(w). CALCULUS.

The topics treated are: Differentials and rates with mechanical applications, change of variable, radius of curvature, evolutes and involutes, envelopes, partial differentiation, law of the mean, developments in finite form, indeterminate forms, convergence of infinite series, Maclaurin's and Taylor's series in one variable and in several variables, limit of error, interpolation, maxima and minima of functions of two variables. Seven lessons. Text: The same as in Mathematics 3(f).

Prerequisite: Mathematics 3(f).

One-third college credit. Equivalent to the winter term of Mathematics 3.

MR. SIMPSON.

3(s). CALCULUS.

The topics treated are: Indefinite and definite integrals, the motion of a projectile, the definite integral as the limit of a sum, successive integration, plane areas, lengths of curves, areas of surfaces, volumes, centers of gravity, moments, work, pressure, and force of attraction. Seven lessons. Text: The same as in Mathematics 3(f).

Prerequisite: Mathematics 3(w).

One-third college credit. Equivalent to the spring term of Mathematics 3.

MR. SIMPSON.

9(f). INTRODUCTION TO THE MATHEMATICS OF INVESTMENT.

Progressions; the binomial theorem; logarithms; compound interest; discount; annuities, rent; capitalized cost; discharge of debts by equal annual payments; monetary tables.

Prerequisite: Mathematics 1a or 1b, with a grade of at least C. If a student has had only Mathematics 1a, he will find it profitable to take Mathematics 1b along with Mathematics 9(f).

One-third college credit. Equivalent to the fall term of Mathematics 9.

MR. DODD.

9(w). THE MATHEMATICS OF INVESTMENT.

Amortization; the valuation of bonds; sinking funds; depreciation; building and loan associations.

Prerequisite: Mathematics 9(f).

One-third college credit. Equivalent to the winter term of Mathematics 9.

MR. DODD.

9(s). INTRODUCTION TO THE MATHEMATICS OF LIFE INSURANCE.

Permutations and combinations; probability; mortality tables; annuities; premiums; loading; policy values.

Prerequisite: Mathematics 9(f). If a student intends to take the whole of Mathematics 9, Mathematics 9(w) may well be taken before Mathematics 9(s).

One-third college credit. Equivalent to the spring term of Mathematics 9.

MR. DODD.

SPANISH

The following courses will prove especially profitable to students who have some knowledge of a foreign language, preferably Latin, and who are acquainted with the technical terms and the arrangement of a grammar dealing with a foreign language. Students who have completed Spanish A or who offer two admission units in high-school Spanish will be admitted to Spanish 1. The textbooks will vary from time to time. The titles below are given chiefly to enable the student to form some idea of the scope of the work. Books should not be ordered until they have been assigned by the instructor.

A(f). BEGINNER'S SPANISH.

Hall's *All Spanish Method, First Book;* easy reading; easy composition.

The books for this and the two following courses will cost about $3.00.

One-third college credit. Equivalent to the fall term of Spanish A.

MR. HALL.

A(w). BEGINNER'S SPANISH.

Continuation of Spanish A(f), using the same text, with other books.

One-third college credit. Equivalent to the winter term of Spanish A.

MR. HALL.

A(s). BEGINNER'S SPANISH.

Continuation of Spanish A(w). Texts to be named by instructor.

One-third college credit. Equivalent to the spring term of Spanish A.

MR. HALL.

NOTE.—The admission requirement of two units in Spanish is represented by Spanish A(f), (w), and (s), and 1(f).

1(f). SECOND-YEAR SPANISH.

Ramsey's *Spanish Grammar;* composition; letter writing; prose reading, some collateral texts, varying from year to year. Examina-

tion will include sight reading and translation. The books for this course will cost about $4.00.

Spanish A is prerequisite.

One-third college credit. Equivalent to the fall term of Spanish 1.

MR. HENDRIX.

1(w). SECOND-YEAR SPANISH.

Continuation of Spanish 1(f). The additional books will cost about $2.00.

One-third college credit. Equivalent to the winter term of Spanish 1.

MR. HENDRIX.

1(s). SECOND-YEAR SPANISH.

Continuation of Spanish 1(w). The additional books will cost about $2.00.

One-third college credit. Equivalent to the spring term of Spanish 1.

MR. HENDRIX.

2(f). CONTEMPORARY SPANISH LITERATURE.

This course consists of a critical study in Spanish of representative modern authors. The drama and the novel will each receive attention. Frequent compositions in Spanish will be required on the works read. The texts will vary.

Prerequisite: Spanish 1.

One-third college credit. Equivalent to the fall term of Spanish 2.

MR. HENDRIX.

2(w). CONTEMPORARY SPANISH LITERATURE.

This course is a continuation of Spanish 2(f), which is prerequisite.

One-third college credit. Equivalent to the winter term of Spanish 2.

MR. HENDRIX.

2(s). CONTEMPORARY SPANISH LITERATURE.

This course is a continuation of the work covered in Spanish 2(f) and 2(w), which are prerequisite.

One-third college credit. Equivalent to the spring term of Spanish 2.

MR. HENDRIX.

NOTE.—Those desiring other work in Spanish than that which is offered are invited to correspond with Mr. W. S. Hendrix, University Station, Austin.

ZOOLOGY

105w. ORGANIC EVOLUTION.

This course deals with the problem of the evolution of animal and plant life. The following are some of the topics which are considered:

The evidence of evolution; the factors which have been operative in the process of evolution; special evolution theories; evolution in relation to present-day problems. This course is open only to students of sophomore standing who are credited with a full biological course (Zoology 1, Zoology 16, or Botany 1), or who have completed with a grade of C the fall term of Botany 1 or Zoology 1, or Zoology 104f. Texts: Scott's *Theory of Evolution*; Kellogg's *Darwinism Today*. The cost of these books is about $6.00.

One-third college credit. Equivalent to Zoology 105w.

Mr. Casteel.

DEPARTMENT OF EDUCATION

141f. Educational Psychology.

This course will treat of those phases of psychology which throw light upon the process of teaching. Such topics as instinct, habit, memory, apperception, will be considered. Ten assignments and a thesis will be required. The texts are Pyle's *Outlines of Educational Psychology* (Warwick and York, Baltimore); Colvin's *The Learning Process* (The Macmillan Co., New York); and McMurray's *Study and Teaching How to Study.*

One-third college credit. Equivalent to Education 141f.

Mr. Gray.

142w. Principles of Teaching.

This course deals with the psychological principles underlying the process of teaching. Emphasis is also put upon the special problems in the teaching of different subjects. The course gives practical applications of the principles discussed in Education 141f. Ten assignments and a thesis will be required. The texts are Kendall and Mirick, *How to Teach the Fundamental Subjects;* and Strayer's *A Brief Course in the Teaching Process.*

The thesis will be a review of *Teaching the Common Branches* by Charters.

One-third college credit. Equivalent to Education 142w.

Mr. Gray.

143s. School Management.

This elementary course deals with the fundamental laws of school organization and school management. Methods of discipline, making of school programs, and the grading and promotion of pupils will receive attention. Ten assignments and a thesis will be required. The texts are Bagley's *Class-room Management* (The Macmillan Co., New York; price, $1.25); Dutton's *School Management* (Scribner's Sons, New York; price, $1.00); a copy of *State School Laws* and *State Course of Study.*

One-third college credit. Equivalent to Education 143s.

Mr. Gray.

Note.—Education 141, 142, 143 are open to freshmen, and together they may be used to satisfy the requirement of one full course in Education for a State first-grade teacher's certificate. See Appendix B.

148f. Experimental Education. A Study of the Psychology of Reading.

An advanced course dealing with the motor problems of reading, perception as it relates to reading, tests for the measurement of oral

and silent reading ability. Methods of diagnosing reading ability, remedial teaching, and methods of teaching. The texts required are Huey's *Psychology and Pedagogy of Reading;* C. T. Gray's *Types of Reading Ability as Exhibited through Tests and Laboratory Experiments;* and W. S. Gray's *Studies of Elementary School Reading through Standardized Tests.*

One-third college credit. Equivalent to Education 148f.

Prerequisite Education 141f, 142w, 143s and Education 45; or Education 203(fw), 104s and Education 5.

Experienced teachers may take Education 148f without the prerequisites, if college credit is not desired.

MR. GRAY.

203fw(f). THE PSYCHOLOGY OF EDUCATION.

This course deals with those phases of psychology which throw light upon the problems of education, both those of the school and of the general educative work of life incident to parenthood and to all kinds of leadership among men. In this term special emphasis is laid on Education as thinking. It is more clearly an interpretation of the teaching process.

The cost of textbooks will be $2.95. The same textbooks serve also for Education 203fw(w), which is a continuation of this and completes the elementary courses in psychology and education required of all regular University students of education.

One-third college credit. Equivalent to the fall term of Education 203fw.

MR. SACKETT.

203fw(w). THE PSYCHOLOGY OF EDUCATION.

This course is a continuation of Education 203fw(f), and deals with the behavioristic aspects of life. It is designed to interpret disciplinary problems and direct habit formations.

The same textbooks are used as for Education 203fw(f).

One-third college credit. Equivalent to the winter term of Education 203fw.

MR. SACKETT.

104s. CHILD STUDY.

This course is intended for teachers, parents, and all others who have to deal with children. It is a study of those changing phases of physical and mental life through which the young must pass in the process of growth and development. The scope of the course is fairly indicated by the following topics which are treated: Scientific methods, developmental stages, physical growth, rise of mental capacities, hygienic recreational and ethical problems, aims and meth-

ods of studying children; plays and games; social instincts; literary tastes; attitudes of children toward discipline and punishment.

The textbook used in this course costs $3.20.

One-third college credit. Equivalent to Education 104s.

MR. SACKETT.

NOTE.—Education 203 and 104 are open to sophomores, and together they may be used to satisfy the requirement of one full course in Education for a State first-grade teacher's certificate. See Appendix B.

234ws(w). THE PSYCHOLOGY OF EDUCATION, ADVANCED.

This is an advanced course continuing the work covered in Education 203fw and 104s by making a special study of certain problems from the sources and from actual experiments. Such topics as the following will be studied: formal discipline; the psychological processes involved in learning, reading, spelling, drawing and writing, arithmetic, music, etc.; the characteristics of the different periods of development of the moral, the religious, the social nature of the child. Topics may be varied within a limited range to suit the individual needs and interests.

Prerequisite: Education 203fw and 104s.

One-third college credit. Equivalent to the winter term of Education 234ws.

MR. SACKETT.

234ws(s). PSYCHOLOGY OF EDUCATION, ADVANCED.

This course is a continuation of Education 234ws(w), with special emphasis placed upon the development of mental powers in children and upon the factors of animal psychology most valuable to teachers. The work may be confined to an intensive study of one or two topics, or the student may acquire a less technical knowledge of a larger number of subjects. A thesis on the subject receiving the greatest amount of attention in the course is required.

Prerequisite: Education 203fw and 104s.

One-third college credit. Equivalent to the spring term of Education 234ws.

MR. SACKETT.

169f. THE PSYCHOLOGY AND PEDAGOGY OF ADOLESCENT GROUPS, ADVANCED.

This course is intended to treat of adolescent group life, and will include the following: A brief review of the phsyical and mental changes during adolescence; the causes and conditions of spontaenous group organizations; genetic significance of adolescent play; pioneer activities in child development; crimes and misdemeanors; health craft and health habits; an account of the organizations for adolescents with detailed study of scout-craft and camp-fire technique; problems of the

rural as contrasted with the urban group; psychological factors in leadership and in personal influence. The study is made from the point of view of those who are attempting, or shall attempt, to direct boys and girls in groups, especially in recreational activities. Those taking this course will be expected to prepare reports or theses on some phases of the subject, or to take personal charge for a time of the recreation activities of an organized group of boys or girls and make satisfactory progress with them, submitting such reports and criticisms of the work as are required by the instructor.

Prerequisite: Education 203fw and 104s.

One-third college credit. Equivalent to Education 169f.

MR. SACKETT.

167. THE PSYCHOLOGY AND PEDAGOGY OF ADOLESCENT GROUPS. BRIEFER COURSE.

This course is based on the same materials as 169f, but is not to be counted as an advanced course.

Prerequisite: Sophomore standing or two years' teaching experience or experience in directing adolescent groups.

One-third college credit. Equivalent to Education 167.

MR. SACKETT.

THE HISTORY OF EDUCATION.

Education 5 is open only to students who have attained junior standing. Education 203fw and 104s are prerequisite in every instance. The course as a whole counts as an advanced course toward the bachelor's degree. Students are advised not to undertake more than two-thirds of this course by correspondence, unless their circumstances are exceptional. Throughout the course the evolution of culture and educational ideals and practises will receive emphasis. The relations of education to the social, political, economic, and philosophic conditions of each period are investigated as far as possible. A thesis of some length will be required before final credit will be given on Education 5.

5(f). HISTORY OF ANCIENT EDUCATION.

In this term a preliminary survey will be made of primitive and oriental culture and modes of training. Greek civilization and education form the major part of the work, and will be studied intensively. Special attention will also be directed to the influence which Greek culture exerted upon Roman civilization, and upon early Christianity. A study of Roman Education to the age of Quintillian will conclude the course.

Textbooks: Paul Monroe's *A Textbook in the History of Education* (The Macmillan Co., New York; price, $2.00); Kenneth J. Freeman's

Schools of Hellas (The Macmillan Co., New York; price, $1.50); S. S. Laurie's *Historical Survey of Pre-Christian Education* (Longmans, Green and Co., London; price, $2.00); Plato's *Republic*, any edition; Paul Monroe's *Source Book of the History of Education. Greek and Roman Periods* (The Macmillan Co., New York; price, $2.25).

Prerequisite: Education 203fw and 104s.

One-third college credit. Equivalent to the fall term of Education 5.

MR. EBY.

5(w). HISTORY OF MEDIEVAL EDUCATION.

Brief attention will be given to Jewish education, in so far as it explains Chrisianity, and to primitive Christian education; the decay of the Greco-Roman schools, monasticism, and Celtic culture will be discussed in detail in connection with the early part of the Middle Ages. Arabian learing, scholasticism, the rise of universities, burgh schools, mysticism, and the influence of feudalism, the crusades, and knighthood will be considered. A study of the inner work of the schools and the extent of the curriculum will be made.

Textbooks: Paul Monroe's *A Textbook in the History of Education* (The Macmillan Co., New York; price, $2.00); J. P. Graves's *A History of Education During the Middle Ages* (The Macmillan Co., New York; price, $1.25); S. S. Laurie's *The Rise and Early Constitution of Universities* (D. Appleton and Co., New York; price, $1.50).

Prerequisite: Education 5(f).

One-third college credit. Equivalent to the winter term of Education 5.

MR. EBY.

5(s). HISTORY OF MODERN EDUCATION.

This course will present a thorough examination of the humanistic revival, the reformation, and counter reformation, the Baconian scientific influence on education, and the rise of state interest in schools. So far as practicable, a study will be made of the great educational reformers such as Locke, Rousseau, Pestalozzi, Froebel, Herbart, etc. A brief summary of educational progress during the nineteenth century concludes the work.

Textbooks: Paul Monroe's *A Textbook in the History of Education* (The Macmillan Co., New York; price, $2.00); H. Quick's *Educational Reformers* (D. Appleton and Co., New York; price, $1.50); J. Locke's *Some Thoughts on Education* (any text); J. J. Rousseau's *Emile* (D. Appleton and Co., New York; price, $1.50).

Prerequisite: Education 5(w).

One-third college credit. Equivalent to the spring term of Education 5.

MR. EBY.

45(f). History of Educational Reforms.

This course and the two following are similar to Education 5(f), (w), and (s) above. The same textbooks will be used.

Prerequisite: Education 141, 142, 143, and junior standing.

One-third college credit. Equivalent to the fall term of Education 45.

Mr. Eby.

45(w). History of Educational Reforms.

A continuation of Education 45(f).

One-third college credit. Equivalent to the winter term of Education 45.

Mr. Eby.

45(s). History of Educational Reforms.

A continuation of Education 45(w).

One-third college credit. Equivalent to the spring term of Education 45.

Mr. Eby.

DEPARTMENT OF ENGINEERING

Architecture

220(a). Instrumental Drawing and Descriptive Geometry.

A series of exercises involving the use of the drawing instruments, the principles of projection, and the solution of problems relating to the point and line, and to plane, curved, and warped surfaces.

One-third college credit. Equivalent to one-half of Architecture 220.

Miss Jefferson.

220(b). Instrumental Drawing and Descriptive Geometry.

A continuation of Architecture 220(a) which is prerequisite.

One-third college credit. Equivalent to one-half of Architecture 220.

Miss Jefferson.

106f. Shades, Shadows, and Perspective.

This course consists of a series of graded exercises selected with special reference to architectural problems. The course is intended to develop the student's power of imagination and to teach him methods of construction which are of practical value in architectural drawing and rendering.

Prerequisite: Architecture 220.

One-third college credit. Equivalent to Architecture 106f.

Mr. Giesecke.

121w. Elementary Architectural Drawing.

This course consists of a series of working drawings of buildings and building details. A simple building will be drawn to a small scale in plan, elevation, section, and perspective, and large scale drawings will be prepared of the doors, windows, fire places, cornices, etc. The aim will be to teach the methods of preparing working drawings for buildings and, incidentally, methods of construction.

Prerequisite: Architecture 20.

One-third college credit. Equivalent to Architecture 121w.

Mr. Giesecke.

28(f). Wood and Masonry Building Construction.

This course describes the method of designing columns, beams, girders, and trusses built of wood or of wood and iron or steel, and the method of designing walls, foundations, and arches built of masonry.

The underlying principles and theories are explained, numerical examples cited, and working drawings prepared.

Prerequisite: Applied Mechanics, equivalent to Civil Engineering 32f and 32w.

One-third college credit. Equivalent to the fall term of Architecture 28.

Mr. Giesecke.

28(w). Steel Building Construction.

This course describes the methods of designing the component parts of steel frames for building: namely, beams, columns, rivets and riveting, plate and box girders, and simple trusses. Numerical examples are given to illustrate the method of designing, and working drawings are required to prepare the student for professional work.

Prerequisite: Applied Mechanics. Equivalent to Civil Engineering 32f and 32w.

One-third college credit. Equivalent to the winter term of Architecture 28.

Mr. Giesecke.

28(s). Reinforced Concrete Building Construction.

This course describes the standard methods of designing the structural parts of reinforced concrete buildings: as, for example, short columns centrally loaded, simple, rectangular, and tee beams, restrained beams, floor and roof slabs, long columns, and columns eccentrically loaded. The theories on which the designs are based are fully explained; the building laws affecting the same are quoted and discussed; sufficient numerical problems are given to familiarize the student thoroughly with the methods employed, and working drawings are required to prepare the student for professional work.

Prerequisite: Applied Mechanics, equivalent to Civil Engineering 32f and 32w.

One-third college credit. Equivalent to the spring term of Architecture 28.

Mr. Giesecke.

112. Architectural History.

This course deals with the technical and historical development of the ancient and early medieval styles of architecture with especial reference to classic architecture. The Egyptian, Assyrian, and Persian periods are first considered; then a more detailed consideration is given to the architecture of Greece, Rome, Byzantium, and to that of the early Romanesque period. Text: Hamlin's *History of Architecture;* Simpson's *History of Architectural Development*, Vols. 1 and 2.

One-third college credit. Equivalent to Architecture 112.

Mr. Gideon.

126. Architectural History.

This course is practically a continuation of 112, though it may be counted as an independent third. It is devoted to Romanesque, Gothic, Renaissance, and Modern architecture. Text: Hamlin's *History of Architecture;* Simpson's *History of Architectural Development*, Vols. 2 and 3.

One-third college credit. Equivalent to Architecture 126.

Mr. Gideon.

Civil Engineering

101. Highway Engineering.

Location, construction, and maintenance of the different kinds of highways, streets, and pavements.

One-third college credit. Equivalent to Civil Engineering 101s.

Mr. Tyler.

102. Surveying.

Use of the chain, tape, compass, and transit in land surveying.

One-third college credit. Equivalent to Civil Engineering 102f.

Mr. Taylor.

103. Descriptive Geometry.

A series of problems in projections, relating to points and lines, and to plane, curved, and warped surfaces, designed to develop the student's power of productive imagination and to prepare him for more advanced work in the graphic arts.

One-third college credit. Equivalent to Civil Engineering 103f.

Mr. Bantel.

126. Elementary Mechanics.

Definitions of force, energy, work, velocity, etc. The laws of statics and dynamics with their application.

One-third college credit. Equivalent to Civil Engineering 126s.

Mr. Finch.

Drawing

201a. Elementary Mechanical Drawing.

This course gives the principles of mechanical drawing as it is practiced by engineers and architects. It is elementary in its nature and is too brief to cover the whole ground, but prepares the student for the next course, or to begin work in a drafting office. Anyone who has good eyesight and free use of the hands may confidently undertake this work. The course is also intended for those who expect to enter an engineering school but will be pressed for time. This and the following course will be found valuable to those who expect to teach the subject in the public schools.

The course consists in making twenty plates, 9 inches by 12 inches in size, together with necessary study of the textbook. Ninety to one hundred hours of work will be found necessary for the average student. These drawings are exercises in the use of instruments, in applied geometry, in freehand lettering, in orthographic projection, and in the development of surfaces. Great stress is laid upon freehand lettering and orthographic projection, since both of these are constantly used in practical engineering and architectural drawing. Some of the drawings are traced on tracing-cloth, and blue prints are made from

the tracings. Half-size lettering sheets are used, two 6-inch by 9-inch sheets counting as one of the twenty.

Textbook: Thos. E. French's *A Manual of Engineering Drawing* (The McGraw-Hill Book Co., 239 West 39th, St., New York; price, $2.00).

The cost of the instruments and materials will be from $12 up, depending upon the quality, but a satisfactory outfit cannot be bought for much less. The materials actually consumed amount to less than $1.00. The book and a complete outfit such as the regular University students use may be obtained from the University Cooperative Society, Austin, Texas. The following manufacturers can supply complete outfits: The Keuffel & Esser Co., St. Louis, Mo.; the Eugene Dietzen Co., New Orleans, La.

One-third college credit. Equivalent to the first half of Drawing 201.

MR. ROWE.

201b. ELEMENTARY MECHANICAL DRAWING.

This is a continuation of Drawing 201a. The student gets more practice in freehand lettering and the development of surfaces and takes up the intersection of surfaces; pictorial representation, including isometric, oblique, cabinet, and other methods of projection; and the making of working drawings in which special stress is laid upon dimensioning. A number of these plates are finished as tracings from the pencil drawing and are blue printed.

For the textbook and materials see Drawing 201a.

One-third college credit. Equivalent to the second half of Drawing 201.

MR. ROWE.

106. MACHINE DRAWING.

This is a course in the drawing of machinery or parts of machinery in accordance with the best practice of this country. The drawings are made from data sheets and sketches, and they are finished as tracings from the pencil drawings. Ten sheets 12 inches by 18 inches are required, which the average student can complete in 90 to 100 hours of work. Accurate drawing and dimensioning are required as well as a good quality of line work and lettering. Drawing 201 is prerequisite.

For the textbook and materials see Drawing 201a.

One-third college credit equivalent to Drawing 106.

MR. ROWE.

NOTE.—All correspondence courses in Electrical Engineering have been for the present withdrawn.

DEPARTMENT OF LAW

Since a ruling of the American Bar Association, the University of Texas Law Department has discontinued all correspondence courses in Law for degree credit. The courses announced are offered without credit for the benefit of those preparing for the State bar examinations, or those desiring simply a knowledge of the subjects studied.

To those persons desiring to prepare for the State bar examination the following information may be useful.

According to the rules of the Supreme Court of Texas, an examination is given the applicant in the following subjects: (1) Blackstone; (2) Real Property; (3) Contracts, including Contracts, Sales, Bills and Notes, Carriers, Partnership, Corporations, and Agency; (4) Torts; (5) Equity; (6) Pleading, Practice and Evidence; (7) Domestic Relations; (8) Constitutional Law; (9) Criminal Law. If the applicant takes all of the subjects that are given in the Department of Extension of the University of Texas set forth below, we feel confident that he will be much better prepared to take the bar examination than most applicants. We do not give a special course on Sales, Corporations, Equity, Domestic Relations, and Constitutional Law, but the subject of Sales is given substantially in the Contracts course; the law of Domestic Relations is treated in the Blackstone, Elementary Law, and Agency courses; Corporations, Constitutional Law, and Equity are treated in the Blackstone, Elementary Law, and Contracts courses. In the course on Elementary Law practically all of the subjects required for the bar examinations are rapidly reviewed; hence it is desirable that the applicant take this course just prior to the time he expects to take the State bar examination.

Should the applicant desire the rules of the Supreme Court of Texas with reference to the subjects upon which the student will be examined, etc., he should write to the clerk of the Supreme Court of Texas, Austin, Texas, and a pamphlet will be sent him setting forth these matters in detail. The examinations are given by the legal examiners appointed by each Court of Civil Appeals.

After the applicant has registered, all letters should be addressed to the instructor in charge of the course.

Any of the books used in the law school may be procured from the University Cooperative Society, Austin, Texas, at the prices stated.

1. Blackstone's Commentaries, Books I and II.

In this course the general principles of the Common Law are taught. Special effort is made to give a thorough knowledge of the history of the Law of Real Estate. This course should be taken by every student who intends to become a lawyer.

The fee for the above course is $14.00. Any complete edition of

Blackstone's Commentaries will suffice. The price of Cooley's Blackstone, third edition, is $5.00.

MR. HILDEBRAND.

2. AMERICAN ELEMENTARY LAW.

In this course the general elementary principles of American Law are taught.

The fee for the above course is $14.00. The textbook is Townes's *American Elementary Law*, second edition; price, $4.00.

MR. COFER.

3. CONTRACTS.

In this course the general principles of the Law of Contracts are taught in detail.

The fee for the above course is $21.00. The books used are *Anson on Contracts*, latest edition edited by Huffcutt, the price of which is $3.00; and Huffcutt and Woodruff's *Cases on Contracts*, second edition, $4.00.

MR. HILDEBRAND.

4. TORTS. A.

In this course the general principles of the law of Torts are taught.

The fee for the above course is $14.00. The text book used is *Townes on Torts;* price, $4.00.

MR. TARLTON.

TORTS. B.

A continuation of the above course.

Fee: $14.00. The textbook is *Townes on Torts;* price, $4.00.

MR. TARLTON.

5. AGENCY.

In this course the general principles of the Law of Agency, including master and servant, are taught. Special reference is made to the Texas Statutes on fellow servants, assumed risk, vice-principal, etc.

The fee for the above course is $14.00. The books used are Huffcut's *Cases on Agency*, second edition; price, $4.00, and *Huffcut on Agency*, second edition; price, $3.00.

MR. HILDEBRAND.

6. CRIMINAL LAW.

In this course the Texas Penal Statutes are thoroughly discussed, together with the leading criminal cases. The book used in this course is McIlwaine's *Annotated Pocket Digest of Texas Laws;* price, $5.50.

The fee for this course is $14.00.

MR. TARLTON.

7. CRIMINAL PROCEDURE.

In this course the Texas Statutes with reference to Criminal Pro-

cedure are thoroughly discussed. The same text is used in this course as in the course in Criminal Law.

The fee for this course is $7.00.

MR. TARLTON.

8. PLEADING. A.

In this course the general rules of Pleading are taught, special reference being made to Texas Pleading. No regular textbook is prescribed in this course; either Townes's *Texas Pleading* (second edition) or Sayles's *Texas Pleading* will suffice. The professor in charge has prepared an outline which will be sent to the student upon application. The price of this outline is $2.50. The price of Townes's *Texas Pleading* is $5.00. Sayles's *Texas Pleading* cannot be procured from the University Cooperative Society.

The fee for the above course is $7.00.

MR. COFER.

PLEADING. B.

A continuation of the above course.

The fee for this course is $14.00.

MR. COFER.

9. PRACTICE. A.

The basis of this course is the Practice Acts as found in the Revised Statutes of Texas. No textbook is used, but students will be expected to refer to Practice Acts as found in the Texas Revised Statutes. The design of this course is to present in a practical way the rules of procedure in actions and suits from the initial process to the termination in the higher courts.

The fee for this course is $7.00.

MR. COFER.

PRACTICE. B.

A continuation of the above course.

The fee for this course is $7.00.

MR. COFER.

10. EVIDENCE. A.

In this course the Common Law rules of evidence are discussed, and the Texas Statutes and cases modifying the Common Law rules are gone into in detail. The textbook used is *McKelvey on Evidence*, second edition, the price of which is $3.75.

The fee for this course is $7.00.

MR. TARLTON.

EVIDENCE. B.

A continuation of the above course.

The fee for this course is $7.00.

MR. TARLTON.

11. Partnership.

In this course the general principles of the Law of Partnership are thoroughly discussed, including what is necessary to make a partnership, powers of the partners, duties of the partners, etc.

The fee for this course is $7.00. The books used are Mechem's *Cases on Partnership*, second edition; price, $3.50; and Mechem's *Elements of Partnership;* price, $2.50.

Mr. Hildebrand.

12. Real Property. A.

In this course the principles of the Law of Real Property are thoroughly gone into, special reference being made to the law of Real Property in the State of Texas, including the law of married women, the homestead law, the rights of creditors against the property of both husband and wife, etc.

The fee for the course is $7.00. The text used is *Hopkins on Real Property;* price, $3.75.

Mr. Tarlton.

Real Property. B.

A continuation of the above course.

The fee for this course is $14.00.

Mr. Tarlton.

13. Carriers. A.

In this course the law of Common Carriers is studied, including the Texas statutes with reference to these subjects.

The fee for this course is $7.00. The textbook used is Hale on *Bailments and Carriers;* price, $3.75.

Mr. Tarlton.

Carriers. B.

A continuation of the above course.

The fee for this course is $7.00.

Mr. Tarlton.

14. Negotiable Instruments.

In this course the law affecting bills, notes, checks, is thoroughly discussed.

The fee for this course is $7.00. The text used in Huffcut's *Negotiable Instruments;* price, $4.50.

Mr. Cofer.

A. American Business Law.

In this course the general principles of contract law, the law of partnership, the law of corporations, the law of bailments, and the law of personal property are discussed. Special reference is made to common forms used by business men, such as contracts, deeds, releases, transfers of superior title, wills, etc. We also discuss the

method of transacting business, including the manner of forming partnerships, corporations, and joint stock companies, etc.

The fee for this course is $7.00. The textbook used is *American Business Law*, second edition, by John J. Sullivan, published by D. Appleton & Company, New York; price, $1.50. After the completion of the textbook a few short typewritten lectures and forms prepared by the instructor will be sent to the student, and the student will be questioned on these lectures and forms. This course is designed for business men, but may be taken with profit by the student of law in the beginning of his studies.

MR. HILDEBRAND.

B. RIGHTS OF MARRIED WOMEN IN TEXAS.

This course is designed especially for the women of Texas. The rights of married women in Texas under our present laws will be thoroughly discussed.

The fee for the course is $7.00. No regular textbook will be used, but the professor of this course has prepared a set of typewritten lectures, the price of which is $1.50.

MR. TARLTON.

GENERAL STATEMENT OF THE METHOD OF TEACHING LAW BY CORRESPONDENCE

The manner of conducting the work in the Extension Department of the Law School is by studying approved textbooks and cases, and in a few instances, by the study of lectures prepared by the professors in charge. Lessons are regularly assigned. Questions covering the principal points in the lessons have already been prepared, and are forwarded from time to time to the pupils. These questions should be answered and returned within a reasonable time. The answers are carefully examined and corrected, and the professor in charge advises the student of any mistakes that he may have made, and writes the student what the correct answers are to those questions that were incorrectly answered.

The student is advised to take the subjects in the order specified above, especially if he is studying law by correspondence with a view of taking the bar examination.

COURSES PREPARATORY TO STATE EXAMINATIONS FOR TEACHER'S CERTIFICATES

For general information concerning State examinations for teacher's certificates see Appendix B.

ALGEBRA (A) FOR BEGINNERS.

This is an elementary course intended for all students who are not well up on the fundamental operations of addition, subtraction, multiplication, and division, as well as the important special cases of multiplication and division, and factoring. All of these subjects will be thoroughly covered; the course will also include work in highest common factor, and least common multiple, and perhaps in other applications.

Textbook: Wentworth's *New School Algebra* (Ginn & Co., Boston; price, $1.10), from beginning through page 122.

No college credit.

MISS DECHERD.

ALGEBRA (B) FOR THE STATE EXAMINATION.

While this course is primarily intended for those desiring to obtain certificates, it will also be of benefit to teachers of algebra in the schools of the State. Familiarity with the fundamental operations will be assumed. The course will vary to meet the needs of individual students, but selection will be made from the following topics: factoring and its applications; ratio and proportion; linear equations with one or more unknowns; quadratics, including radicals; simultaneous equations.

The text will be the same as in course A.

No college credit.

MISS DECHERD.

NOTE.—Upon the successful completion of course B in Algebra the student will be allowed two units admission credit.

BOOKKEEPING FOR THE STATE EXAMINATION.

Students who desire to prepare for the State Examination in this subject should enroll for Bookkeeping A, which is announced on page 24.

PLANE GEOMETRY (A) FOR THE STATE EXAMINATION.

As in the course in algebra, the course in plane geometry is intended for teachers who are preparing to obtain a certificate and for teachers of the subject in the schools of the State. Especial attention will be paid to the logical development of the subject, to the importance of

certain fundamental propositions, and to the solution of originals. On account of the amount of subject-matter, the course is divided into two parts for each of which a fee of $7.00 is charged. (A) Books I and II. Text: Wentworth-Smith's *Plane Geometry*, price, 80 cents.

No college credit.

MISS HORTON.

PLANE GEOMETRY (B) FOR THE STATE EXAMINATION.

A continuation of Plane Geometry (A), Books III, IV, V.

No college credit.

MISS HORTON.

NOTE.—Upon the satisfactory completion of Plane Geometry (A) and (B), one unit admission credit will be granted.

SOLID GEOMETRY.

Students who desire to prepare for the State examination in this subject should enroll for Mathematics 1x with or without college credit.

TRIGONOMETRY.

Students who desire to prepare for the State examination in this subject should enroll for Mathematics 1a with or without college credit.

CHEMISTRY FOR THE STATE EXAMINATION.

It is the aim of this course to give such instruction as will satisfy the State Department of Education. The course will be strictly descriptive with a very few simple experiments that will be necessary to verify the text. Any textbook may be used, but to give uniformity to the course the instructor will follow the work as outlined in *First Principles of Chemistry*, Brownlee and others (Allyn and Bacon, Chicago; price, $1.25).

This course is given only to those who wish to do permanent certificate work in preparation for the State examinations.

No college credit.

MR. DUNCAN.

CIVICS (see p. 47).

GEOGRAPHY FOR STATE EXAMINATION.

A course of lessons in modern geography, based upon the adopted textbook, has been especially arranged to meet the needs of candidates for teacher's certificate. The course presupposes some knowledge of the subject and will serve to emphasize the essentials rather than the details.

Text: Tarr and McMurray's *World Geographies, Second Book* (The Macmillan Co.; price, 88 cents).

No college credit.

Miss Simonds.

Physical Geography for the State Examination.

This course has been prepared for candidates desiring to prepare for the first-grade teacher's certificate. (Those preparing themselves to teach Physical Geography in the high school should take the course in Physiography offered under Geology, page 42.) The lessons are based upon the adopted textbook and cover the subject somewhat in detail. For those having some knowledge of the subject, this course will afford an excellent opportunity for review.

Text: Tarr's *Physical Geography* (The Macmillan Co.; price, 88 cents).

No college credit.

Miss Simonds.

General History (A)—Ancient.

Ancient History from the dawn of civilization to the establishment of Germanic kingdoms in western Europe, cir. 500 A. D. A brief survey of the rise of civilization in the eastern nations will be made; but approximately one-third of the course will be devoted to Greece, and two-thirds to Rome. The state adopted text will be used.

No college credit.

Mr. Gutsch.

General History (B)—Medieval and Modern.

Medieval History, from the break-up of the Roman Empire to the sixteenth century. The chief topics treated will be the migrations, the disintegration of the Roman Empire, the early church, monasticism, the Carlovingian empire, feudalism, the Holy Roman Empire, the rise of the papacy, the development of modern states, medieval culture, the crusades, the rise of the Italian and German cities, and the Renaissance.

Modern History, from the beginning of the Protestant Revolution to the present time. Especial attention will be given to the Protestant Revolution; the religious struggles in Germany, France, the Netherlands, and England; the ascendency of France under Louis XIV; the constitutional development in England; the rise of Prussia and Russia; the colonial expansion of England; the causes and progress of the French Revolution; the work of Napoleon; the conflict of liberalism and reaction in Europe; the unification of Germany and Italy, and some aspects of contemporary Europe. The State adopted text will be used.

No college credit.

Mr. Gutsch.

Note.—Upon the satisfactory completion of these two courses in history, two admission units in history will be granted.

LITERATURE, ENGLISH AND AMERICAN

The courses in English and American Literature are arranged to meet the requirements of the State Department of Education, and aim to prepare teachers for the State examinations in these subjects. No examination will be set by the instructor in charge of these courses, and no prerequisite other than a general preparation equivalent to second-year high-school work or a second-grade teacher's certificate will be required. The courses are also suitable for general reading by those who do not care to do regular college work.

ENGLISH LITERATURE FOR STATE EXAMINATION.

The aim of this course is to give a general survey of English Literature and to study in detail a number of the most typical English masterpieces. The textbooks used will vary from year to year, an effort being made to follow the directions of the State Department of Education as these are given out from time to time, will be given particularly in 1916, in preparation for the State examination of that year, but with the consent of the instructor, students may be admitted at any time.

No college credit.

MR. THOMPSON.

AMERICAN LITERATURE FOR THE STATE EXAMINATION.

The aim of this course is to give a general survey of American Literature and to study in detail a number of American classics in poetry and prose. The textbooks will vary from time to time, but in general the announcements of the State Department of Education will be followed. The course will be offered particularly in 1917, preparatory to the examinations in American Literature given by the State Department of Education, but with the consent of the instructor, students may be admitted to it at any time.

No college credit.

MR. THOMPSON.

PSYCHOLOGY FOR THE STATE EXAMINATION.

Students desiring to prepare for the State Teacher's Examinations in this subject are advised to take Education 141f, and read the text prescribed by the State Department of Education. This will furnish thorough preparation in the subject.

THE HISTORY OF EDUCATION FOR STATE EXAMINATION.

Each year a course in the history of education will be offered which will present the work prescribed by the State Department of Education for that year. In addition to this course, offered regularly, other

courses covering special periods in the history of education may be arranged for through the Correspondence Division.

The regular course for 1916, offered to assist those preparing for the state examinations, will be based upon Grave's *A Student's History of Education* (The Macmillan Co., New York; price, $1.10). The following chapters will be omitted: III, IV, V, VII, VIII, XIV, XX.

No college credit.

MR. SHEPHERD.

APPENDIX A

ADMISSION

Admission to all departments of the Main University is under the control of the dean of the faculty. Admission to the Department of Medicine is under the control of the dean of that department.

COLLEGE OF ARTS

Age. Applicants for admission must be at least sixteen years old. Applicants who seek to meet the scholarship requirements by individual approval must be at least twenty-one years old.

Character. Applicants for admission must furnish evidence of good moral character. Testimonals from their latest instructors are preferred.

Vaccination. Each applicant for admission must present a certificate, signed by a physician in one of the forms given below,* that he has had smallpox or has been successfully vaccinated.

Pledge. Each applicant for admission must sign the following pledge: "I pledge myself on my honor not to encourage or participate in hazing or rushes during my attendance at the University, provided that contests among students conducted according to rules approved by the faculty shall not be classed as rushes."

Scholarship. Scholarship requirements are expressed in terms of credits, one credit unit implying nine months of high-school study of five class periods a week at least forty minutes long.

The standard of admission to the College of Arts is fourteen and one-half units of high-school credit, chosen from the list below, subject to these restrictions: 1. Three units must be presented in English; two in history or in history and civics; two in algebra; one in plane geometry; and two in one foreign language, ancient or modern. 2. Not more than four units may be presented in history

---

*Smallpox and vaccination forms:

1. This is to certify that_____has had smallpox.
   Date:_____Signed:_____M. D.

2. This is to certify that_____has been successfully vaccinated at two different times, the dates being:
   _____
   Date:_____Signed:_____M. D.

3. This is to certify that_____has been successfully vaccinated within the last five years.
   Date:_____Signed:_____M. D.

4. This is to certify that I have today vaccinated_____
   Date:_____Signed:_____M. D.

In case the vaccination here attested is not successful, re-vaccination by one of the University physicians may be required after admission.

and civics together, and not more than two in vocational subjects. 3. Biology may not be presented by a student who presents either botany or zoology.

The increase in the standard of admission from the fourteen units hitherto required to fourteen and a half units does not represent an increase in the amount of work required. It is due to giving two units' credit to algebra instead of one and one-half in recognition of the fact that at least two full years are now given to algebra in most high schools.

Admission with Conditions. Until further notice, students may in either respect must be made good to the satisfaction of the dean of the faculty within two years.

Admission conditions may be removed (1) by taking with approval of the dean of the faculty the regular admission examination be admitted conditionally with only twelve and one-half units and without satisfying the foreign language requirement, but a deficiency in subjects not studied by the student in the Universiey; (2) by counting work done in the University. The prescribed admission units must be satisfied by work in the corresponding subjects in the University; the elective admission units may be absolved by any University work. In satisfying admission conditions, a course counts as the equivalent of one and one-half units. Courses used to absolve admission requirements will not count towards a degree. If a student does not satisfy his admission conditions within two years after admission, he must present one additional unit for each year that his conditions remain unsatisfied. Conditions may not be removed by taking admission examinations later than two years after admission. After that time they may be removed only by work done in the University.

Students admitted by individual approval to English 1 will, on completing that course, be given credit also for three admission units in English. Similarly, students admitted to Mathematics 1 will, on completing that course, receive credit also for two admission units in algebra, and one in plane geometry. Further, students admitted to the College of Arts or the Department of Engineering by individual approval and making, during their first long session, at least five courses with an average grade of C will in addition be credited with all admission conditions in free elective units.

Note.—Beginning with September, 1919, fifteen units will be required for full admission, thirteen for conditional admission.

SUBJECTS AND UNITS THAT MAY BE PRESENTED FOR ADMISSION

English, 3 or 4
History and Civics:
- Ancient History, 1
- Medieval and Modern H., 1
- American History, 1
- English History, 1
- Civics, ½

Mathematics:
- Algebra, 2
- Plane Geometry, 1
- Solid Geometry, ½
- Trigonometry, ½

Foreign Languages:
- Latin, 2, 3, or 4
- Greek, 2 or 3
- German, 2 or 3
- French, 2 or 3
- Spanish, 2 or 3

Natural Sciences:
- Biology, 1
- Botany, 1
- Chemistry, 1
- Introduction to Science, 1
- Physics, 1
- Physiography, ½
- Physiology and Hygiene, ½
- Zoology, 1

Vocational Subjects:
- Agriculture, ½—2
- Bookkeeping, 1
- Domestic Art, ½ or 1
- Domestic Science, ½ or 1
- *Drawing, ½ or 1
- *Manual Training, ½ or 1
- Stenography and Typewriting, 1

For details respecting the character and extent of the preparation desired in the several subjects, see Apendix A.

HOW SCHOLARSHIP REQUIREMENTS MAY BE MET. Scholarship requirements may be met in four ways: by diploma, by state teacher's certificate, by examination, by individual approval.

By Diploma. Graduates of affiliated schools are credited with the subjects they have completed in which the schools are affiliated. In order to determine these credits, they are required to present statements of their work made out by the superintendent or principal on the University's official blank, to be had of the registrar. It is of the highest importance that the applicant send this blank, properly filled out, to the registrar, in advance, or bring it with him when he comes to enter. The former is better. Without it he cannot be admitted, and valuable time will be lost if it has to be sent for after he comes to Austin.

If the number of units to which the statement entitles the holder is less than the number required for admission, the deficiency must be made up by examination.

A graduate of an affiliated school who presents more than fourteen and a half units receives credit for the surplus towards his degree only in case he secures advanced standing in a particular subject and successfully continues that subject in the University. Sur-

*For admission to the Department of Engineering as many as two units may be presented in drawing and in manual training.

plus credits in other subjects will not enable foreign language work required for admission to be counted towards a degree.

No credit is given for work done at an affiliated school unless the candidate is a regular graduate of the school.

The University of Texas has no affiliated schools outside of Texas, but it will usually accept, for work done in a school in another state, credits granted by the state university of that state; or, in the absence of such an institution, by another institution of recognized standing acquainted with the work of the school in question. A student of a school in another state than Texas should, therefore, apply to the state university of that state, or, in the absence of such an institution, to a neighboring college of recognized standing for a valuation of his credits, and submit it to the University of Texas.

By State Teacher's Certificate. Applicants holding a first-grade state teacher's certificate will receive credit for eight and a half units; three in English, two in algebra, one in plane geometry, one in ancient history, one in medieval and modern history, one-half in civics. Applicants holding a permanent state teacher's certificate will receive credit for twelve and a half units: three in English, two in algebra, one in plane geometry, one-half in solid geometry, one-half in trigonometry, one in ancient history, one in medieval and modern history, one-half in civics, three without specification of subject (none in foreign language).

By Examination. Any or all scholarship requirements may be met by passing the admission examinations.

For further information, write to E. J. Mathews, Registrar of the University of Texas, Austin, Texas.

By Individual Approval. At the discretion of the dean of the faculty, an applicant over twenty-one years old may be admitted without examination on the following conditions:

1. He must make application on the official blank (to be had of the registrar), giving the information there desired.

2. He must furnish evidence that he has substantially covered the ground of the units required of other candidates, and that he has sufficient ability and seriousness of purpose to do the work desired with profit to himself and to the satisfaction of the University.

3. He must show, by the writing or a composition, that he has an adequate command of English.

Applicants are advised to send their applications and credentials in advance of their coming to Austin, but in no case can the application be granted without a personal interview.

Admission by individual approval contemplates applicants who have not recently attended school and are not, therefore, in a position to pass the admission examinations.

Students so admitted may register for courses other than freshman courses only with the approval of the chairman of the school concerned and the dean of the faculty, given because of evidence of special fitness.

Neglect of work or other evidence of lack of serious purpose on the part of a student thus admitted will cause the withdrawal of the dean's approval, thus severing the student's connection with the University, and preventing his readmission until he has satisfied all admission requirements.

Students admitted by individual approval can not become candidates for degrees until they have satisfied the admission requirements. As to how to remove admission conditions, see page 54 of the University catalog.

Admission with Advanced Standing. Applicants who, in addiiton to satisfying the admission requirements, wish to obtain advanced standing in any school must secure, by examination or otherwise, the consent of the chairman of the school concerned, and this consent must be approved by the dean of the faculty.

Admission of Students from Other Colleges. A student seeking admission from another college must present (1) a letter of honorable dismissal; (2) a vaccination certificate; (3) a catalogue of the college from which he comes; (4) a full statement of the work he has done, including the work credited at entrance. This statement must be made out on the University's official blank (to be had of the registrar) and must be duly certified by the authorities of the student's college. Much trouble and time will be saved if the blank is filled out and certified in advance of the student's coming to Austin. Students are not allowed to register, until the proper certificates are presented.

All credits given students from other colleges are conditional. If their work here is of a low grade, the amount of credit given to individual students may be reduced.

Like other applicants for admission, students from other colleges must sign a pledge to do no hazing.

Admission of Students from the State Normal Schools. Students desiring admission from the state normal schools of Texas must meet the requirements made of students from other colleges as enumerated in the preceding section.

Write to the Registrar for further information.

APPENDIX B

STATE TEACHERS' CERTIFICATES

For the convenience of teachers who plan to take the State examinations for teachers' certificates or to raise a certificate already held to one of a higher grade, the following information is printed:

EXAMINATIONS FOR CERTIFICATES

Any person holding a valid State certificate of the first grade or of the second grade may obtain certificate of higher grade by passing the examination in the additional subjects prescribed for said certificate of higher grade. A person holding no certificate may take the examination in all the subjects which are prescribed by law as leading to the permanent certificate, or he may take the examination in the seventeen subjects leading to the first-grade certificate, or the seventeen subjects leading to the permanent primary certificate.

Should an applicant apply for a first-grade, a permanent, or a permanent primary certificate, he will be granted the lower grade certificate in the event that, failing to pass the examination for the higher certificate, he satisfies the legal requirements with respect to the lower certificate.

The following paragraphs, taken from information furnished by the State Department of Education, give the recent rulings concerning teachers' certificates:

I. Certificate Based on Examination

1. An applicant for a State or county second-grade certificate shall be examined in the following eleven subjects: Spelling, reading, writing, arithmetic, English grammar, geography, Texas history, elementary physiology and hygiene with special reference to narcotics, school management and methods of teaching, United States history, and elementary agriculture.

A county second-grade certificate can not be issued to the same person more than once, but this limitation does not apply to a State second-grade certificate.

If the applicant shall make on the required subjects an average grade of not less than seventy-five per cent and below eighty-five per cent, and a grade on each subject of not less than fifty per cent, his certificate shall be valid until the fourth anniversary of the thirty-first day of August of the calendar year in which the examination was held; but if the applicant shall make on the required subjects an average of eighty-five per cent or more, and a grade of not less

than fifty per cent on each subject, the certificate shall be valid until the sixth anniversary of the thirty-first day of August of the calendar year in which the examination was held. A State or county second-grade certificate authorizes the holder thereof to contract to teach only in the primary grades of the public schools; that is, in the grades below the high school.

2. An applicant for a State first-grade certificate shall be examined in the eleven subjects prescribed for a State second-grade certificate and in addition thereto, in the following six subjects: English composition, civil government, algebra, physical geography, elementary geometry, and general history.

If the applicant shall make on the required subjects an average grade of not less than seventy-five per cent and below eighty-five per cent, and a grade on each subject of not less than fifty per cent, his certificate shall be valid until the fourth anniversary of the thirty-first day of August of the calendar year in which the examination was held; but if the applicant shall make on the required subjects an average grade of eighty-five per cent or more and a grade of not less than fifty per cent on each subject, the certificate shall be valid until the sixth anniversary of the thirty-first day of August of the calendar year in which the examination was held. A State first-grade certificate authorizes its holder to contract to teach in any public free school in Texas.

3. An applicant for a State permanent certificate shall be examined in the seventeen subjects prescribed for a State first-grade certificate and in addition thereto, in the following eight subjects: History of education, psychology, English and American literature, physics, chemistry, solid geometry, plane trigonometry, and elementary double-entry bookkeeping. An applicant in order to be entitled to receive a State permanent certificate must make on the twenty-five prescribed subjects a general average grade of not less than eighty-five per cent, and a grade on each subject of not less than fifty per cent. The holder of a State permanent certificate is authorized to contract to teach in any public free school in Texas.

4. The applicant for a State permanent primary certificate shall be examined in the eleven subjects prescribed for a State second-grade certificate, and in addition thereto in the following six prescribed subjects: Civil government, English composition, physical geography, history of education, elementary psychology applied to teaching, and English and American literature. An applicant in order to be entitled to receive a State permanent primary certificate shall make on the prescribed seventeen subjects an average grade of not less than eighty-five per cent and a grade on each subject of not less than fifty per cent. This certificate shall entitle the holder to contract to teach in the primary grades only of the public schools; that is, in the grades below the high school.

II. Certificate in Universities and Colleges

1. A teacher's diploma conferred by the University of Texas upon a student who has satisfactorily completed at least four full courses in the department of education, and has satisfied the requirements for the degree of bachelor of arts, when presented to the State Department of Education, with satisfactory evidence of having done the required work in education, shall entitle its holder to receive a State permanent certificate.

2. Any person who holds a diploma conferring on him the degree of bachelor of arts, or any equivalent bachelor's degree, or any higher academic degree, from any college or university of the first-class, and who has not had four full courses in education, but who has taught three years in this State, may receive from the State Superintendent of Public Instruction a State permanent certificate. The institutions to be recognized as colleges or universities of the first-class shall be determined by the State Superintendent of Public Instruction upon the recommendation of the State Board of Examiners.

3. A person who has satisfactorily completed four full courses in the College of Arts and one full course in the department of education of the University of Texas, or any college or university ranked as first-class by the State Board of Examiners, shall, upon presentation of satisfactory evidence of having done the required work, be entitled to receive from the State Department of Education a State first-grade certificate, valid from the date of issuance until the fourth anniversary of the thirty-first day of August of the calendar year in which the certificate was issued.

III. Building to Certificates of Higher Grade

1. The holder of a county second-grade certificate can not, under the law, build to a certificate of higher grade; but the holder of a State second-grade certificate may build to a State permanent primary certificate by taking the examination in the following prescribed additional subjects, the applicant having the privilege of being examined in one or more of said subjects at any examination: Civil government, English composition, physical geography, history of education, elementary psychology applied to teaching, and English and American literature. The holder of a State second-grade certificate may also build to a State first-grade certificate by taking the examination in the following prescribed additional subpects, the applicant having the privilege of being examined in one or more of the subjects at any examination: English composition, civil government, algebra, physical geography, elements of geometry, and general history.

2. The holder of a State first-grade certificate may build to a State permanent certificate by taking the examination in the following prescribed additional subjects, the applicant having the privilege of being examined in one or more of said subjects at any examination: History of education, psychology, English and American literature, chemistry, solid geometry, physics, plane trigonometry, and elementary double-entry bookkeeping. The holder of a State first-grade certificate may also build to a State permanent primary certificate by taking the examination in the following prescribed additional subjects, the applicant having the privilege of being examined in one or more of said subjects at any examination: History of education, elementary psychology, applied to teaching, and English and American literature.

3. The holder of a State permanent primary certificate secured by building on a State second-grade certificate may build to a State permanent certificate during the first six years of the validity of the said State permanent primary certificate by taking the examination in the following prescribed additional subjects, the applicant having the privilege of being examined in one or more of said subjects at any examination: Chemistry, physics, solid geometry, plane trigonometry, elementary double-entry bookkeeping, algebra, plane geometry, and general history.

4. The holder of a State permanent primary certificate secured by building on a State first-class certificate may build to a State permanent certificate at any time during the first six years of the validity of said State permanent primary certificate by taking the examination in the following prescribed additional subjects, the applicant having the privilege of being examined in one or more of said subjects at any examination: Chemistry, physics, solid geometry, plane trigonometry, elementary double-entry bookkeeping.

5. A State certificate issued because of work done in the University of Texas, a Texas State Normal School, or any college or university of the first-class, may be built upon through the regular examinations to a certificate of higher grade; and in taking the examination in the prescribed additional subjects, the applicant shall make a general average of not less than seventy-five per cent or eighty-five per cent, as the class of certificate may require, and on each subject a grade of not less than fifty per cent.

For more specific and detailed information write to the State Department of Education, Capitol Station, Austin.

B135-917-15h

University of Texas Bulletin

No. 1742: July 25, 1917

ANNOUNCEMENT OF COURSES

IN THE

DEPARTMENT OF LAW

FOR THE

LONG SESSION OF 1917-1918

Published by the University six times a month and entered as second-class matter at the postoffice at AUSTIN, TEXAS

For the Service of the State

DEPARTMENT OF LAW

FACULTY

ROBERT ERNEST VINSON, D. D., LL. D., *President.*
JOHN CHARLES TOWNES, LL. D., *Professor of Law, Dean of the Department of Law.*
WILLIAM STEWART SIMKINS, *Professor of Law.*
BENJAMIN DUDLEY TARLTON, B. A., LL. D., *Professor of Law.*
LAUCH MCLAURIN, LL. D., *Professor of Law.*
IRA POLK HILDEBRAND, LL. M., *Professor of Law.*
CHARLES SHIRLEY POTTS, M. A., LL. B., *Professor of Law and Government, Assistant Dean of the Department of Law.*
ROBERT EMMET COFER, LL. B., *Professor of Law.*
GEORGE C. BUTTE, M. A., J. U. D., *Professor of Law.*
ALBERT BENEDICT WOLFE, PH. D., *Adjunct Professor of Economics.*
WILBUR MUNDAY CLEAVES, LL. M., *Adjunct Professor of Law.*
ABNER LEON GREEN, B. A., LL. B., *Adjunt Professor of Law.*
HOMER JACKSON BRUCE, LL. B., *Registrar.*

MRS. ANNA IRENE SANDBO, LL. M., *Quizmaster.*
IONE PETTEY SPEARS, B. A., *Law Librarian.*

HISTORY AND BUILDING

The Department of Law was opened at the same time with the Department of Literature, Science, and Arts (now the College of Arts) in 1883. The two departments occupied the same building until the session of 1908-1909, when the Law Building, a handsome, well-equipped, fireproof structure, was completed. All the exercises of the department are now held in this building.

*Owing to resignations, other quizmasters, and librarians, are to be selected.

ADVANTAGES OF LOCATION

Exceptional advantages for observing the practice of the various courts are afforded the law students by the fact that the supreme court of the state, the court of criminal appeals, and the court of civil appeals for the third supreme judicial district are in session at Austin during the entire academic year. A term of the United States district court is held in Austin during the University winter term. Two state district courts and a county court are in session during a large part of the academic year.

The students thus have unusual opportunities to observe the conduct of civil and criminal cases in the state and federal trial courts, to hear the discussion of causes involving questions of law and equity under the federal procedure, and to listen to arguments in the appellate courts by some of the most distinguished lawyers of the country.

LIBRARIES

The Law Library. The law library consists of about 11,000 carefully selected books. It contains a number of sets of the Texas Reports, the United States Reports, the American Decisions, American Reports, and American State Reports, the Lawyers' Reports Annotated, both series, the New York Reports, Pacific States Reports, and practically all of the state reports up to the National Reporter System, the Revised English Reports, the Federal Reporter, the Federal Cases, The English Reprint, all the West Publication Reports except the New York Supplement, standard text-books, and a valuable collection of works appertaining to American and English constitutional history and law. The library is under the direct supervision and control of the Library Committee, and has been largely improved in books and facilities for service. It is open to all students from 8 a. m. to 10:30 p. m. every day except Sunday.

General Library. The students of the Department of Law have access to the general library of the University.

Other Libraries. The state library is open to all the citizens of the state. Students are frequently extended courtesies by other departments of the state government having sets of Texas Reports.

GENERAL STATEMENTS

The catalogue, issued in the spring of each year, is intended to give such a description of the work of the University and such a digest of its rules as are needed by students. Neither the courses announced nor the rules given are valid beyond the succeeding year, for before the end of the succeeding year a new catalogue will have been issued, superseding all previous catalogues. Ordinarily a student may expect to be allowed to secure a degree in accordance with the requirements of the curriculum laid down in the catalogue in force when he entered the department in which the degree is offered, but the faculty reserves the right to make changes in curricula, as in rules, at any time when in its judgment such changes are for the best interests of the students.

It is the earnest desire and fixed purpose of those having control of the Department of Law to keep it in touch with the advancing ideals in professional education; and at the same time to make it of the highest practical value to all the people of the state. The first demands that professional education shall be preceded by a larger amount of general culture and information than is represented by a high school education, several law schools now requiring an academic degree as a prerequisite to entrance; while the latter forbids that the benefits of the institution should be put beyond the reach of those students whose academic training has unavoidably stopped short of a bachelor's degree. Under the circumstances, the time of law study leading to a bachelor's degree has been fixed at three scholastic years; and the admission requirements for candidates for a law degree have been fixed at the units necessary to enter the College of Arts plus five academic courses. Mature students, not candidates for a degree, may enter by individual approval, with less preparation, as shown under the head of Admission below.

While candidates for the law degree are permitted to enter the department with only five academic courses to their credit, they are not permitted to graduate on that basis. Three additional academic courses must be taken during the three years of law, so that a student can not obtain a law degree without at least eight academic courses to his credit. As the law work is equivalent to fifteen academic courses, it follows that a law degree represents work equivalent to twenty-three academic courses.

Students admitted by individual approval who desire to become candidates for the LL. B. degree may do so by completing all the work required of regular candidates for a degree and removing their academic admission conditions.

Every law student unless credited or excused by the Dean of the College of Arts, is required to absolve one year's work in physical training.

The details of all the matters thus generally stated are given under appropriate headings in subsequent portions of the catalogue, and, in case of conflict, the detailed provisions will control.

ADMISSION

Admission to the Department of Law, as to all other departments of the Main University, is under the control of Mr. E. J. Matthews, Registrar, and all correspondence on this subject should be addressed to him. Neither the dean of the Department of Law nor any other member of the law faculty has jurisdiction in this matter. General information as to admission to Main University will be found in Appendix I, page 29 of this pamphlet. The regulations may be summarized as follows:

Applicants for admission to the Department of Law must be at least nineteen years old, and must present evidence (1) that they are of good moral character; (2) that they have been properly vaccinated; (3) that they have fulfilled the scholarship requirement of fourteen units for admission to the College of Arts (or twelve units with a condition of two), and have in addition completed five courses in the College of Arts or their equivalent in another institution, including one in English and one in History.

In addition, applicants may be admitted as special students, not candidates for a degree, by individual approved without examination, if they are at least twenty-three years old, and furnish evidence (1) that they are of good moral character; (2) that they have been properly vaccinated; (3) that they have substantially covered the ground of the fourteen units demanded of applicants for admission to the College of Arts (or twelve units with a condition of two), and that they have sufficient ability and seriousness of purpose to do the work they desire with profit to themselves and to the satisfaction of the University.

The same course can not be counted both to absolve admission requirements and towards a degree.

The regulations governing admission to the College of Arts, as given on pages 53-60 of the Catalogue of 1916-1917, are reproduced in Appendix I, page 29 of this pamphlet.

ADVANCED STANDING

For Work Done in Other Approved Schools. Students desiring advanced standing for law work done in other law schools must meet the academic requirements for admission as in other cases.

Credit will be allowed for work done in actual attendance in approved law schools* under the following conditions:

1. The student must file with the dean a written application for the credits which he desires.

2. This must show (*a*) the topics in which credits are sought; (*b*) in what school the work was done; (*c*) the length of time given to each topic, the books studied, and the method of instruction pursued; (*d*) the method of grading in such school, the grade required for passing, and the grades made by him in all work taken in the school; (*e*) if any topic in which he desires credit does not appear under the same name in the curricula of the two schools, then he must show such facts as prove the work which he did to be substantially equivalent to that for which he desires credit; (*f*) the application must be accompanied by certificates from the proper authority of the school attended, showing the credits, and should be accompanied with a catalogue of the school for the year when the student was there.

Credit will be allowed only for work clearly shown to be equivalent to the work done here, and never for more than two years' work. The last three terms of work counted toward a law degree must be done in residence.

By Examination. No law degree will be conferred unless the candidate has studied law for at least three scholastic years.

Credit for not exceeding one year may be obtained by examination for advanced standing under the following conditions:

1. The topic for which such credit is sought must be one coming in either the junior or middle year. It must have been studied in a law school whose work is not approved for credit.

---

*Approved law schools comprise all schools belonging to the Association of American Law Schools and any other schools approved for this purpose by vote of the Law Faculty.

2. A grade of at least 85 must be made on the examination. Examinations for this purpose will be given during the week in which each session opens and at no other time unless special arrangement is made with the dean at the opening of the session to attend the class and take examination with it.

No student has the right to examination for advanced standing except at the time and under the conditions set out above.

Classification of Students. Students are classified as regular students, irregular students, and special students.

A regular student is one who has satisfied the admission requirements, and is a candidate for a degree.

An irregular student is one who has satisfied the admission requirements, but is not a candidate for a degree.

A special student is one who has not satisfied the admission requirements, and is not a candidate for a degree.

ORDER OF TOPICS

Great care has been given to the arrangement of the courses in the several years and in the several terms in each year. A logical sequence has been sought and the faculty believes it has been found. It is therefore required that the topics be taken in the order of arrangement. In exceptional cases this will be departed from, but only so far as circumstances make practically imperative.

The number of required hours of law work, fifteen hours per week, is greater than in most good schools and is believed to be sufficient to profitably occupy the time of the average student. In cases in which students have not absolved the required college courses the academic work adds three hours per week, thus giving six regular courses, which is everywhere recognized as full work. There will, however, occur cases of exceptional character or cases in which a student is credited with one or more junior topics. In such instances additional work may be taken under the following restrictions.

As far as it can possibly be done, middle law students must bring up unabsolved junior topics. When all junior topics are credited, in taking additional work, preference must be given to middle electives.

Seniors must bring up all unabsolved back work current in the term. This is to be taken in connection with the requirement that all junior work must be absolved before beginning of the winter term of the senior year in order to be counted toward a degree. If junior topics are not made up before the opening of the winter term of the senior year they must still be taken, but will not count on the number of required hours. This does not apply to students coming from an approved school whose curriculum is arranged differently from ours and taking only one year's work here.

INSTRUCTION

Length of Course. The course of instruction in law extends through three years of nine months each. Each year is divided into fall, winter, and spring terms. Each class has at least fifteen hours a week of class-room exercise in law topics, exclusive of practice court. Examinations are held at the end of each term in the topics studied during that term.

Method of Instruction. The individuality of the teacher is recognized, and hence no set system of instruction is prescribed. In the more elementary topics, text-books, lectures, and cases are used as the basis of instruction. As the student advances in acquaintance with the terminology and general principles of the law, the study of leading cases becomes a more important feature of his work. The design of the department is to acquaint the student with the fundamental principles of the law and to accustom him to recognizing and applying these principles in connection with the study of concrete statement of facts.

The principles of the common law are thoroughly and adequately taught, but special attention is given to the differences between the Texas system of jurisprudence and that prevailing elsewhere.

To ascertain the student's grasp of the subject and to practice him in giving expression to his thoughts, he is subjected, from time to time, to oral quizzes. With a view to encouraging regularity of work and facility and clearness of expression, written exercises are frequently required.

Each professor may give oral quizzes and give them such value in determining grades as he may think proper. Written quizzes are given in each class by the professor and quizmaster, at times named in the schedule of work. Each student is required to attend all quizzes in subjects taken by him. Each quiz is graded, and the grades are counted in determining credits to be allowed.

Regular Examinations. At the end of each term an examination is given on each topic studied during that term. To be entitled to enter such examination, a student must have been regular in his attendance on the class exercises and quizzes, and must have an average quiz grade (made up from the written quizzes and such oral and additional written tests as the professor in charge of the topic may determine to include in the estimate) of at least 80 per cent. To entitle to credit in a topic, the examination grade must be at least 80 per cent, provided that in topics extending over two terms, students who fail on the first term's examination, but who make 75 or over on such examination, may remove the condition by making 90 or more on the examination in the topic at the end of the next term.

No student shall be eligible to examination in any topic in which he has been absent for any cause from more than one-third of the class exercises in such topic.

Deferred Examinations. Students who are entitled to regular examination in any topic and have been excused from taking such examinations at the regular time may, if bona fide seniors and candidates for degrees at close of session then current, take deferred examinations in such topics during the week beginning the first Monday in May. All students other than such bona fide seniors who have been permitted to defer any examination must take such examination at the opening of the next session at the time of the advanced standing examinations.

Examinations to Remove Conditions. A student who has taken law topics in either the long or the summer session and who has made as much as 70 on the examination in any subject, may remove a condition in such subject by taking an examination at the opening of the session in which credit is sought, and

makng a grade of 85 on such examination. These examinations are given during the week in which the session opens. All students desiring such examinations must apply therefor in writing at least one week before the opening of the session when such examinations are to be given. Students entitled to remove conditions by examination at the opening of a session may remove the conditions by registering for the course and attending the class exercises of that session, or if there be a conflict of class hours, by taking the quizzes and taking the examinations with the class, making a grade of 80 per cent or over. Students are not permitted to take examination in such topics without having registered for them at the proper time.

Re-examinations. Re-examinations during a session will not be allowed except to members of the senior class, and to them only as to examinations taken in the fall and winter terms. No student will be re-examined in more than two topics during the session, or more than once in the same topic. No student making less than 75 per cent on the final examination will be re-examined. A student entitled to and desiring re-examination must make application therefor to the dean within one week after the grades showing his failure have been announced. Re-examination will be given only during the week beginning the first Monday in May.

In all cases of successful re-examination the record shall read, "Credit on Re-examination," and no grade will be entered on the permanent records of the department.

Quizmasters. The regents appoint each year, on the nomination of the president, five graduates of the Department of Law as quizmasters. It is the duty of a quizmaster to keep a correct record of all attendance in the classes to which he is assigned, to notice and report to the dean any misconduct in classes or quizzes, and to assist in examining and accurately grading the quiz and examination papers in his subjects, and to perform such other duties as may be properly required in connection with such subjects.

Practice Court. The senior class meets for practice work three periods a week. The student is required, as far as possible, to take every step in the preparation and trial of a cause.

The basis of the work in the trial courts is a statement of facts, from which the student draws the appropriate pleadings and motions. The questions of substantive and adjective law thus raised are presented and argued in open court. Actual practice is given in preparing bills of exception, assignments of error, briefs under the Texas statutes, and rules of court relating to appellate procedure.

The practice court work has been much improved in recent sessions. Almost the entire time of one professor is now given to it and a well-equipped court room has been provided. Instruction is given in the preparation and trial of cases in the courts of original jurisdicton, the preparaton of the record for appeal, and taking up the case to a higher court and its trial in such court. The professor in charge presides, and the work of the attorneys is all done by the students under the professor's supervision. The work is made as thorough as is practicable, and good results are being accomplished. A written examination will be required at the end of each term.

The work of the practice court is efficiently supplemented by the Cofer, Hildebrand, and Tarlton law societies. These societies are voluntary student organizations, not directly under the supervision of the law faculty, in which trials are conducted with the procedure of a regular court of original jurisdiction. Various members of the faculty, at the request of the students, attend the meetings and assist and instruct the students in their proceedings. The work has been found very beneficial.

Advancement to a Higher Class. Each student who has regularly met all the requirements for the completion of junior courses will be advanced to the middle class. Each student who has regularly met all the requirements for the completion of the junior and middle courses will be advanced to the senior class.

No student who is not credited with three-fourths of all the work required in the junior year can be advanced to the middle class. No student who is not credited with seven-eighths of all the junior and middle work can be advanced to the senior class.

Former students not credited with all junior work will not be advanced to the senior class, except upon vote of the faculty.

Such students must absolve all junior topics before the beginning of the winter term of their senior year.

REGISTRATION

Students are required to register in person for each term, in 1917-1918 as follows: For the fall term, before Monday, October 1; for the winter term, on Thursday, January 3; for the spring term, on Monday, March 18. Those who register after the appointed dates will be required to pay a fine of three dollars.

At the opening of the fall term registration is restricted as follows: Candidates for degrees the following June may register on any one of the four registration days, Wednesday, Thursday, Friday, Saturday; other former students only on Friday and Saturday; first-year students only on Wednesday and Thursday and the afternoon of Saturday.

After October 15 students will be allowed to enter only if, in addition to fulfilling the admission requirements, they pass satisfactory examinations upon the back work of the courses they desire to take.

Each applicant for readmission must sign the pledge not to haze required of applicants for admission.

REQUIREMENTS FOR DEGREES

Requirement of Time. The department offers two degrees Bachelor of Laws (LL. B.) and Master of Laws (LL. M.).

No degree will be conferred without a residence of at least one year at the University, during which the applicant shall have done senior or post graduate work.

No student can secure the Bachelor's degree unless he shall have studied law during a period of at least three scholastic years of thirty weeks each, with an average of at least ten hours' required class-room work each week. Ordinarily this study must have been done in an approved law school. In exceptional cases, a portion of the work, in no case amounting to more than one year, may have been done in law schools for work in which credit is not allowed. In all such cases rigid

examinations must be passed as set out under the heading Advanced Standing.

No student can secure the Master's degree until he has completed one full year's work in the Department after having received the Bachelor's degree.

Bachelor of Laws. Regular students candidates for the LL. B. degree must absolve:

Regular class-room work in law.....1350 hours
Practice Court ..... 90 hours
All quiz work.

If such students have not absolved Government 4 (or its equivalent), Economics 6 (or its equivalent), Public Speaking 210, together with Philosophy 102, or History 5, or an advanced course in the School of Social Sciences, in addition to the fourteen admission units to the College of Arts and the five college courses required for admission to the department; then such of said courses as are not absolved must be taken in connection with the law work.

Not more than eighteen hours of law work may be carried concurrently, except in unusual cases and for short periods, and then only upon vote of the faculty.

Each student must, before May 15 of his senior year, show such ability to write clear and correct English as to satisfy the committee on students' use of English. To promote the habitual use of clear and correct English the written work of every student in all his courses (theses, reports, quizzes, examination papers, etc.) is subject to inspection by the committee. It is the duty of each member of the teaching staff to require that his students shall be careful in their use of English, to give due weight in the making up of grades to the student's use of English, and to report promptly to the committee, submitting the evidence, any student whose use of English is seriously defective. Each session the committee will pass on the written work of every student. If any student be found deficient, the committee will prescribe for him such work as in its judgment is proper, and this work must be done to the satisfaction of the committee before the student can obtain his degree.

Master of Laws. To be eligible for the degree of Master of

Laws, a student must have both an A. B. (or equivalent degree) and an LL. B. degree from this institution or from some other institution regarded as of equal rank.

A candidate for this degree must complete:

Advanced law work 360 hours, of which at least 180 hours must be graduate courses.

A satisfactory thesis on some legal subject approved by the faculty, which shall represent at least as much work as one full course.

To be entitled to the Master's degree the student must make an average grade of 90 per cent in all work taken for his Master's degree.

For the thesis each candidate for the Master's degree must select, by the 15th of November of his graduate year, a law subject, which must be approved by the dean of the Department of Law, and upon which he must immediately begin work. The work on the thesis must be done regularly and systematically under the general supervision and direction of the dean of the Department of Law or of the law professor having in charge the subject to which the thesis relates. The thesis must be submitted for approval not later than the third Monday in April, and a final copy not later than the Monday preceding the spring term examinations of his graduating year, and must be approved both by the dean of the department and by the professor under whose direction it was prepared.

Candidates for the Master's Degree are subject to the requirement regarding proficiency in English laid down for candidates for the LL. B. degree.

SPECIAL STUDENTS

Special students who have not absolved English 1 and Government 4fw, will not be registered for more than 15 hours of law work per week and will be required to take and carry the academic courses named above in addition to their law work. Failure to do so will drop them from the department.

If such students have absolved said academic topics, they may be relieved from further academic work.

In either event such students will be permitted to attend class in other topics, but will not be quizzed, examined or given credit for such attendance.

A special student may become a regular student by satisfying the admission requirements, that is, the fourteen units required for admission to the College of Arts, and the additional requirement of five college courses (including one in English and one in History). An average grade of 90 per cent in his law work for each of the three years of the curriculum considered separately will take the place of all admission requirements to the college except those in English, History, and Mathematics.

SCHEDULE OF CLASSES

FALL TERM

Hr.	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9	Agency Crim. Law A Int. Law A	Agency Law Books Pub. Sp. 210	Agency Crim. Law A Int. Law A	Agency Law Books Pub. Sp. 210	Agency Crim. Law A Int. Law A	Agency Law Books Pub. Sp. 210
10	Bank Const. L. Ele. Law	Evi. A Const. L. Ele. Law	Bank. Const. L. Ele. Law	Evi. A Const. L. Ele. Law	Bank. Const. L. Ele. Law	Evi. A Const. L. Ele. Law
11	Pr. Prop. A Wills Pub. Sp. 210	Admin. Law A Ins. Rom. Law A	Pr. Prop. A Wills	Admin. Law A Ins. Rom. Law A	Pr. Prop. A Wills	Admin. Law A Ins. Rom. Law A
12	Adm. Est. A Admiralty Econ. 6	Conts. A Equity A	Adm. Est. A Admiralty Econ. 6	Conts. A Equity A	Adm. Est. A Admiralty Econ. 6	Conts. A Equity A
2	Prac. A	Pr. Ct. A	Prac. A	Pr. Ct. A	Prac. A	Pr. Ct. A
3	Gov. 4	Wills	Gov. 4 Equity A	Convey. A	Gov. 4	

WINTER TERM

9	Com. Paper Crim. Law B Int. Law B Mining A	Mu. Corp. A Part. Pub. Sp. 210	Com. Paper Crim. Law B Int. Law B Mining A	Mu. Corp. A Part. Pub. Sp. 210	Com. Paper Crim. Law B Int. Law B Mining A	Mu. Corp. A Part. Pub. Sp. 210
10	Pri. Corp. A R. Prop. A Torts A	Evi. B Torts A	Pri. Corp. A R. Prop. A Torts A	Evi. B Torts A	Pri. Corp. A R. Prop. A Torts A	Evi. B Torts A
11	Pr. Prop. B Pub. Sp. 210	Admin Law B Car. A Plead. A Rom. Law B	Pr. Prop. B Pub. Sp. 210	Admin Law B Car. A Plead. A Rom. Law B	Pr. Prop. B Pub. Sp. 210	Admin Law B Car. A Plead. A Rom. Law B
12	Adm. Est. B Pub. Util. A Econ. 6	Conts. B Equity B Damages A	Adm. Est. B Pub. Util. A Econ. 6	Conts. B Equity B Damages A	Adm. Est. B Pub. Util. A Econ. 6	Conts. B Equity B Damages A
2	Prac. B	Pr. Ct. B	Prac. B	Pr. Ct. B	Prac. B	Pr. Ct. B
3	Gov. 4		Gov. 4 Equity B	Convey. B	Gov. 4	

SPRING TERM

9	Mining B Int. Law C Surety Crim. Pro.	Mortg. Mu. Corp. B	Mining B Int. Law C Surety Crim. Pro.	Mortg. Mu. Corp. B	Mining B Int. Law C Surety Crim. Pro.	Mortg. Mu. Corp. B
10	Pri. Corp. B R. Prop. B	Pri. Corp. B R. Prop. B Torts B	Pri. Corp. B R. Prop. B	Pri. Corp. B R. Prop. B Torts B	Pri. Corp. B R. Prop. B	Pri. Corp. B R. Prop. B Torts B
11	Mining B Plead. B Phil. 102 Quasi Cont.	Car. B Conf. Law Plead. B Tax.	Mining B Plead B Phil. 102 Quasi Cont.	Car. B Conf. Law Plead B. Tax.	Mining B Plead. B Phil. 102 Quasi Cont.	Car. B Conf. Law Plead. B Tax.
12	Fed. Cts. Pub. Util. B Econ. 6	Conts. C Damages B Fed. Cts. Juris.	Fed. Cts. Pub. Util. B Econ. 6	Conts. C Damages B Fed. Cts. Juris.	Fed. Cts. Pub. Util. B Econ. 6	Conts. C Damages B Fed. Cts. Juris.
2	Sales	Pr. Ct. C	Sales	Pr. Ct. C	Sales	Pr. Ct. C
3	Gov. 4		Gov. 4		Gov. 4	

COURSES OF INSTRUCTION

The courses of instruction given during the session of 1917-1918 will be as follows:

JUNIOR CLASS

Fall Term

**American Elementary Law:* MTWTFS, 10. Room 105.
Townes' *Elementary Law.*
Quiz: Oct. 15, Nov. 5, Nov. 26, Dec. 10 (Opt.).
Professor CLEAVES.

**Contracts* A: TTS, 12. Room, 105.
Williston's *Cases on Contracts.*
Quiz: Oct. 25, Nov. 22, Dec. 5 (Opt.).
Professor HILDEBRAND.

**Criminal Law* A: MWF, 9. L. B. 105.
Mikell's *Cases on Criminal Law, Clark on Criminal Law* and Texas Statutes and Cases.
Quiz: Oct. 19, Nov. 30, Dec. 7 (Opt.).
Professor GREEN.

**Law Books:* TTS, 9. Room 105.
Townes' *Law Books and How to Use Them,* library references and cases.
Quiz: Oct. 22, Nov. 19, Dec. 3 (Opt.).
Professor GREEN.

Government 4. MWF, 3. Room 105.
Beard's *American Government and Politics.*
Quiz: Oct. 29, Nov. 30, Dec. 12 (Opt.).
Professor POTTS

Winter Term

**Contracts* B: TTS, 12. Room 105.
Williston's *Cases on Contracts.*
Quiz: Jan. 26, Feb. 16, Feb. 28 (Opt.).
Professor HILDEBRAND

*All courses marked with an asterisk (*) are required courses.

**Criminal Law* B: MWF, 9. Room 105.
Mikell's *Cases on Criminal Law, Clark on Criminal Law,* and Texas Statutes and Cases.
Quiz: Jan. 21, Feb. 15, March 1 (Opt.).
Professor GREEN.

**Pleading* A: TTS, 11. Room 105.
Townes' *Texas Pleading,* Analytical Outline, and Cases.
Quiz: Jan. 24, Feb. 21, March 5 (Opt.).
Professor COFER.

**Torts* A: MTWTFS, 10. Room 105.
Townes on Torts, and Cases.
Quiz: Jan. 18, Feb. 4, Feb. 18, March 4 (Opt.).
Professor TOWNES.

Government 4: MWF, 3. Room 105.
Macy's *The English Constitution.*
Quiz: Jan. 28, Feb. 25, March 6 (Opt.).
Professor POTTS.

Spring Term

**Contracts* C: TTS, 12. Room 105.
Williston's *Cases on Contracts.*
Quiz: April 6, May 4, May 25 (Opt.).
Professor HILDEBRAND.

**Criminal Procedure:* MWF, 9. Room 105.
Texas Statutes and Cases, and a text to be selected.
Quiz: April 8, May 6, May 24 (Opt.).
Professor GREEN.

**Pleading* B: MTWTFS, 11. Room 105.
Townes' *Texas Pleading,* Analytical Outline, and Cases.
Quiz: April 1, April 20, May 13, May 27 (Opt.).
Professor COFER.

*All courses marked with an asterisk (*) are required courses.

**Torts* B: TTS, 10. Room 105.
Townes on Torts, and Cases.
Quiz: April 11, May 11, May 21 (Opt.).
Professor TOWNES.

Government 4: MWF, 3. Room 105.
Lowell's *Governments of France, Germany and Italy.*
Quiz: April 15, May 17, May 22 (Opt.).
Professor POTTS.

MIDDLE CLASS

Fall Term

Administrative Law A: TTS, 11. Room 209.
Freund *Cases on Administrative Law.*
Quiz: Nov. 1, Dec. 1, Dec. 11 (Opt.).
Professor POTTS.

Agency: MTWTFS, 9. Room 201.
Wambaugh's *Cases on Agency.*
Quiz: Oct. 20, Nov. 12, Dec. 1, Dec. 8 (Opt.).
Professor HILDERRAND.

Bankrupty: MWF, 10. Room 201.
Text to be selected.
Quiz: Oct. 22, Nov. 19, Dec. 3 (Opt.).
Professor COFER.

**Evidence* A:: TTS, 10. Room 201.
McKelvey on Evidence, and Cases.
Quiz: Oct. 22, Nov. 24, Dec 8. (Opt.).
Professor TARLTON.

Insurance: TTS, 11. Room 201.
Vance's Cases on Insurance.
Quiz: Oct. 30, Nov. 27, Dec. 6 (Opt.).
Professor GREEN.

*All courses marked with an asterisk (*) are required courses.

Personal Property A: MWF, 11. Room 201.
Warren's Cases on Property.
Quiz: Oct. 24, Nov. 21, Dec. 10 (Opt.).

Professor CLEAVES.

**Practice* A: MWF, 2. Room 201.
Statutes, Outlines and Cases.
Quiz: Oct. 25, Nov. 23, Dec. 5 (Opt.).

Professor COFER.

Economics 6: MWF, 12. Room 101.

Professor WOLFE.

Winter Term

Administrative Law B: TTS, 11. Room 209.
Freund's *Cases on Administrative Law.*
Quiz: Jan. 29, Feb. 21, Feb. 28 (Opt.).

Professor POTTS.

Carriers A: TTS, 11. Room 201.
Texa to be selected.
Quiz: Feb. 2, Feb. 21, March 7 (Opt.).

Professor CLEAVES.

Commercial Paper: MWF, 9. Room 201.
Huffcutt's *Negotiable Instruments*, Texas Statutes and Cases.
Quiz: Jan. 23, Feb. 15, March 1 (Opt.).

Professor MCLAURIN.

Damages A: TTS, 12. Room 201.
Beale's *Cases on Damages*, 2nd ed., and Texas cases.
Quiz: Jan. 24, Feb. 23, March 5 (Opt.).

Professor GREEN.

**Evidence* B: TTS, 10. Room 201.
McKelvey on Evidence, and Cases.
Quiz: Jan. 29, Feb. 19, March 5 (Opt.).

Professor TARLTON.

Partnership: TTS, 9. Room 201.
Burdicks' *Cases on the Law of Partnership* (subject to change)
Quiz: Jan. 31, Feb. 21, March 7 (Opt.).
Professor HILDEBRAND.

Personal Property B: MWF, 11. Room 201.
Warren's *Cases on Property.*
Quiz: Jan. 25, Feb. 20, March 6 (Opt.).
Professor CLEAVES.

**Practice* B: MWF, 3. Room 201.
Statutes, Cases, and Outlines.
Quiz: Jan. 21, Feb. 11, Feb. 27 (Opt.).
Professor COFER.

**Real Property* A: MWF, 10. Room 201.
Hopkins on Real Estate, Texas Statutes and Cases.
Quiz: Jan. 28, Feb. 18, March 4 (Opt.).
Professor TARLTON.

Carriers B: TTS, 11. Room 201.
Text to be selected.
Quiz: April 16, May 14, May 28 (Opt.).
Professor CLEAVES.

Damages B: TTS, 12. Room 201.
Beale's *Cases on Damages,* 2nd Ed., and Texas Cases.
Quiz: April 9, May 7, May 25 (Opt.).
Professor GREEN.

Mortgages: TTS, 9. Room 105.
Wyman's *Cases on Mortgages* (1906 ed.).
Quiz: April 18, May 18, May 21 (Opt.).
Professor BUTTE.

Quasi Contracts: MWF. 11. Room 201.
Thurston's *Cases on Quasi-Contracts.*
Quiz: April 10, May 8, May 24 (Opt.).
Professor CLEAVES.

*All courses marked with an asterisk (*) are required courses.

**Real Property* B: MTWTFS, 10. Room 201.
Hopkins on Real Estate, Texas Statutes and Cases.
Quiz: April 2, April 30, May 16, May 23 (Opt.).
Professor TARLTON.

Sales: MWF, 2. Room 209.
Williston's *Cases on Sales* (2nd ed.).
Quiz: April 12, May 15, May 27 (Opt.).
Professor GREEN.

Suretyship and Guaranty: MWF, 9. Room 201.
Child's *Suretyship and Guaranty.*
Quiz: April 5, May 10, May 22 (Opt.).
Professor MCLAURIN.

Economics 6: MWF, 12. Room 101.
Professor WOLFE.

SENIOR CLASS

Fall Term

Administration of Estates A: MWF, 12. Room 209.
Simkins' *Administration of Estates in Texas.*
Quiz: Oct. 19, Nov. 21, Dec. 7 (Opt.).
Professor SIMKINS.

Admiralty: MWF, 12. Room 201.
Ames' *Cases on Admiralty.*
Quiz: Oct. 29, Nov. 28, Dec. 14 (Opt.).
Professor BUTTE.

**Constitutional Law:* MTWTFS, 10. Room 209.
McClain's *Cases on Constitutional Law.*
Quiz: Oct. 15, Nov. 5, Nov. 26, Dec. 10 (Opt.).
Professor MCLAURIN.

Conveyancing A: Thursday, 3. Room 209.
Text to be selected.
Professor MCLAURIN.

*All courses marked with an asterisk (*) are required courses.

**Equity* A: W, 3; TTS, 12. Room 209.
Simkins on Equity.
Quiz: Oct. 23, Nov. 13, Dec. 1, Dec. 11 (Opt.).
Professor SIMKINS.

International Law A: MWF, 9. Room 209.
Stowell and Munro's *International Cases.*
Quiz: Oct. 31, Nov. 28, Dec. 12 (Opt.).
Professor BUTTE.

Roman Law A: TTS, 9. Room 209.
League's *Roman Private Law.*
Quiz: Nov. 3, Nov. 27, Dec. 8 (Opt.).
Professor BUTTE.

Wills: MWF, 11; T, 3. Room 209.
Gardner on Wills, Texas Statutes and Cases.
Quiz: Nov. 2, Nov. 23, Dec. 4 (Opt.).
Professor TARLTON.

Practice Court A: TTS, 2. Room 9.
Professor COFER.

Winter Term

Administration of Estates B: MWF, 12. Room 209.
Simkins's *Administration of Estates in Texas.*
Quiz: Jan. 30, Feb. 20, March 1 (Opt.).
Professor SIMKINS.

Conveyancing B: Th., 3. Room 209.
Professor MCLAURIN.

**Equity* B: W., 3; TTS, 12. Room 209.
Simkins on Equity.
Quiz: Jan. 22, Feb. 12, Feb. 23, March 7 (Opt.).
Professor SIMKINS.

*All courses marked with an asterisk (*) are required courses.

International Law B: MWF, 9. Room 209.
Stowell and Munro's *International Cases.*
Quiz: Feb. 1, Feb. 25, March 6 (Opt.).
Professor BUTTE.

Mining Law A: MWF, 11. Room 201.
Text to be announced.
Quiz: Feb. 1, Feb. 25, March 6 (Opt.).
Professor CLEAVES.

Municipal Corporations A: TTS. 9. Room 209.
Beale's *Cases on Municipal Corporations.*
Quiz: Jan. 26, Feb. 16, Feb. 26 (Opt.).
Professor MCLAURIN.

**Private Corporations* A: MWF. 10. Room 209.
Warren's *Cases on Private Corporations* (2nd ed.) and Hildebrand's *Cases on Private Corporations* (Supplement). 3rd ed.
Quiz: Jan. 28, Feb. 18, March 4 (Opt.).
Professor HILDEBRAND.

Public Utilities A: MWF. 12. Room 201.
Lectures, Cases and Research.
Quiz: Jan. 30, Feb. 20, Feb. 27 (Opt.).
Professor TOWNES.

Roman Law B: TTS, 11. Room
League's *Roman Private Law.*
Quiz: Jan. 31, Feb. 19, Feb. 28 (Opt.).
Professor BUTTE.

Practice Court B: TTS. 2. Room 9.
Professor COFER.

An academic course.

---

*All courses marked with an asterisk (*) are required courses.

Spring Term

Conflict of Laws: TTS, 11. Room 9.
Lornzen's *Cases on Confict of Laws.*
Quiz: April 11, May 11, May 21 (Opt.).
Professor BUTTE.

Federal Courts: MTWTFS, 12. Room 209.
Simkin's *A Federal Suit in Equity.*
Quiz: April 6, May 7, May 18, May 28 (Opt.).
Professor SIMKINS.

International Law C: MWF, 9. Room 209.
Stowell and Munro's *International Cases.*
Quiz: April 8, May 6, May 20 (Opt.).
Professor BUTTE.

Jurisprudence: TTS, 12. Room 1.
Quiz: April 9, May 7, May 23 (Opt.).
Professor TOWNES.

Mining Law B: MWF, 11. Room 201.
Text to be announced.
Quiz: April 15, May 15, May 24 (Opt.).
Professor CLEAVES.

Municipal Corporations B: TTS, 9. Room 209.
Beale's *Cases on Municipal Corporations.*
Quiz: April 4, May 9, May 23 (Opt.).
Professor MCLAURIN.

**Private Corporations* B: MTWTFS, 10. Room 209.
Warren's *Cases on Private Corporations* (2nd ed.), and Hildebrand's *Cases on Private Corporations* (Supplement). 3rd. ed.
Quiz: April 1, April 20, May 13, May 27 (Opt.).
Professor HILDEBRAND.

*All courses marked with an asterisk (*) are required courses.

Taxation: TTS, 11. Room 209.
Goodnow, *Cases on Taxation.*
Quiz: April 16, May 14, May 28 (Opt.).

Professor POTTS.

Practice Court C: TTS, 2.

Professor COFER.

An academic course.

APPENDIX I

ADMISSION*

Admission to all departments of the main University is under the control of the dean of the faculty. Admission to the Department of Medicine is under the control of the dean of that department.

COLLEGE OF ARTS

Age. Applicants for admission must be at least sixteen years old. Applicants who seek to meet the scholarship requirements by individual approval must be at least twenty-one years old.

Character. Applicants for admission must furnish evidence of good moral character. Testimonials from their latest instructors are preferred.

Vaccination. Each applicant for admission must present a certificate, signed by a physician in one of the forms given below,† that he has had smallpox or has been successfully vaccinated.

Pledge. Each applicant for admission must sign the following pledge: "I pledge myself on my honor not to encourage or participate in hazing or rushes during my attendance at the University, provided that contests among students conducted according to rules approved by the faculty shall not be classed as rushes."

Scholarship. Scholarship requirements are expressed in terms of credits, one credit unit implying nine months of high school study of five class periods a week at least forty minutes long.

The standard of admission to the College of Arts is fourteen and one-half units of high-school credit, chosen from the list below, subject to these restrictions: 1. Three units must be presented in English; two in history or in history and civics; two

---

*This extract from pages 53-60 of the Catalogue of 1916-1917 gives the rules governing admission to the University.

†Smallpox and vaccination forms:

1. This is to certify that.....has had smallpox.
   Date..... Signed: .....M. D.

2. This is to certify that.....has
   been successfully vaccinated at two different times, the dates being:
   .....
   Date..... Signed: .....M. D.

3. This is to certify that.....
   has been successfully vaccinated within the last five years.
   Date..... Signed: .....M. D.

4. This is to certify that I have today vaccinated.....
   Date..... Signed: .....M. D.

In case the vaccination here attested is not successful, revaccination by one of the University physicians may be required after admission.

in algebra; one in plane geometry; and two in one foreign language, ancient or modern. 2. Not more than four units may be presented in history and civics together, and not more than two in vocational subjects. 3. Biology may not be presented by a student who presents either botany or zoology.

The increase in the standard of admission from the fourteen unites hitherto required to fourteen and a half units does not represent an increase in the amount of work required. It is due to giving two units' credit to algebra instead of one and one-half, in recognition of the fact that at least two full years are now given to algebra in most high schools.

Admission With Conditions. Until further notice, students may be admitted conditionally with only twelve and one-half units and without satifying the foreign language requirement, but a deficiency in either respect must be made good to the satisfaction of the dean of the faculty within two years.

Admission conditions may be removed (1) by taking with approval of the dean of the faculty the regular admission examination in subjects not studied by the student in the University; (2) by counting work done in the University. The prescribed admission units must be satisfied by work in the corresponding subjects in the University; the elective admission units may be absolved by any University work. In satisfying admission conditions, a course counts as the equivalent of one and one-half units. Courses used to absolve admission requirements will not count towards a degree. If a student does not satisfy his admission conditions within two years after admission, he must present one additional unit for each year that his conditions remain unsatisfied. Conditions may not be removed by taking admission examinations later than two years after admission. After that time they may be removed only by work done in the University.

Students admitted by individual approval to English 1 will on completing that course, be given credit also for three admission units in English. Similarly, students admitted to Mathematics 1 will, on completing that course, receive credit also for two admission units in algebra, and one in plane geometry. Further, students admitted to the College of Arts or the Department of Engineering by individual approval and making, during their first long session, at least five courses with an average grade of C will in addition be credited with all admission conditions in free elective units.

NOTE.—Beginning with September, 1919, fifteen units will be required for full admission, thirteen for conditional admission.

SUBJECTS AND UNITS THAT MAY BE PRESENTED FOR ADMISSION

English, 3 or 4
History and Civics:
- Ancient History, 1
- Medieval and Modern H., 1
- American History, 1
- English History, 1
- Civics, ½

Mathematics:
- Algrebra, 2
- Plane Geometry, 1
- Solid Geometry, ½
- Trigonometry, ½

Foreign Languages:
- Latin, 2, 3, or 4
- Greek, 2 or 3
- German, 2 or 3
- French, 2 or 3
- Spanish, 2 or 3

Natural Sciences:
- Biology, 1
- Botany, 1
- Chemistry, 1
- Introduction to Science, 1
- Physics, 1
- Physiography, ½
- Physiology and Hygiene, ½
- Zoology, 1

Vocational Subjects:
- Agriculture, ½—2
- Bookkeeping, 1
- Domestic Art, ½ or 1
- Domestic Science, ½ or 1
- *Drawing, ½ or 1
- *Manual Training, ½ or 1
- Stenography and Typewriting, 1

For details respecting the character and extent of the preparation desired in the several subjects, see Appendix A.

HOW SCHOLARSHIP REQUIREMENTS MAY BE MET. Scholarship requirements may be met in four ways: by diploma, by state teacher's certificate, by examination, by individual approval.

By Diploma. Graduates of affiliated schools are credited with the subjects they have completed in which the schools are affiliated. In order to determine these credits, they are required to present statements of their work made out by the superintendent or principal on the University's official blank, to be had of the registrar. It is of the highest importance that the applicant send this blank, properly filled out, to the registrar, in advance, or bring it with him when he comes to enter. The former is better. Without it he cannot be admitted, and valuable time will be lost if it has to be sent for after he comes to Austin.

If the number of units to which the statement entiles the holder is less than the number required for admission, the deficiency must be made up by examination.

A graduate of an affiliated school who presents more than fourteen and a half units receives credit for the surplus towards his degree only in case he secures advanced standing in a particular subject and successfully continues that subject in the University. For the rules governing admission to advanced standing, see page 59. Surplus

*For admission to the Department of Engineering as many as two units may be presented in drawing and in manual training.

credits in other subjects will not enable foreign language work required for admission to be counted towards a degree.

No credit is given for work done at an affiliated school unless the candidate is a regular graduate of the school.

The University of Texas has no affiliated schools outside of Texas, but it will usually accept, for work done in a school in another state, credits granted by the state university of that state; or, in the absence of such an institution, by another institution of recognized standing acquainted with the work of the school in question. A student of a school in another state than Texas should, therefore, apply to the state university of that state, or, in the absence of such an institution, to a neighboring college of recognized standing for a valuation of his credits, and submit it to the University of Texas.

By State Teacher's Certificate. Applicants holding a first-grade state teacher's certificate will receive credit for eight and a half units; three in English, two in algebra, one in plane geometry, one in ancient history, one in medieval and modern history, one-half in civics. Applicants holding a permanent state teacher's certificate will receive credit for twelve and a half units; three in English, two in algebra, one in plane geometry, one-half in solid geometry, one-half in trigonometry, one in ancient history, one in medieval and modern history, one-half in civics, three without specification of subject (none in foreign language).

By Examination. Any or all scholarship requirements may be met by passing the admission examinations.

To secure credit in any subject, the applicant must make a grade not lower than D. In grading examination papers, whatever the subject, account will be taken of the applicant's use of English. Excellence in one subject will not make up for deficiency in another. Credits are not divisible in any subject.

Every natural science examination paper must be accompanied by a laboratory note book. For specimen examination questions, see Appendix B.

The following are the dates and order of the admission examinations for 1917:

Monday, May 21 and September 17: 9 to 12, English; 2 to 6, history and civics.

Tuesday, May 22 and September 18: 9 to 12, mathematics; 2 to 5, Latin.

Wednesday, May 23 and September 19: 9 to 12, Greek and modern languages; 2 to 5, natural sciences.

Thursday, May 24 and September 20: 9 to 12, other subjects.

Examinations in vocational subjects are given only in Austin.

Solely for the benefit of those who present to the dean of the faculty satisfactory reasons for being absent from the September

examinations and other series of examinations is held on the same days of the week and in the same order three weeks later.

It is strongly urged that applicants desiring to enter the University in September attempt the May examinations. It is permitted to divide the subjects between the spring and fall examination periods, but credits obtained at the spring examinations lapse unless the applicant passes the deferred examinations the following fall; and credits obtained at the fall examinations, if less than the total number required, are not valid later.

The fall examinations are held only in Austin; the spring examinations in Austin, at affiliated schools which make application, and at other approved centers, under the supervision of examiners appointed by the president.

The following regulations govern the spring examinations held at places other than the University:

1. Not later than the first Monday in May, the registrar will send, under seal, admission examination questions to affiliated schools and other approved centers which have applied for them.

2. The examinations, after being duly advertised, will be held in such places as the examiners may appoint, on the third Monday in May and two following days in the same order as the fall examintions.

3. Each applicant, before entering the examinations, shall pay a fee of three dollars to the examiner, to be retained by him.

4. The examiner shall open the sealed envelope containing the questions in the presence of the applicants.

5. The answers shall be written in ink, on legalcap paper, on one side only; and the paper shall close with a pledge that no aid has been received or given.

6. The examination in any one subject shall not continue longer than three hours.

7. As soon as the series of examinations is completed, the examiner shall forward the papers to the registrar, with a certificate that the examination has been conducted fairly and in accordance with these rules. *It is important that all papers be forwarded promptly. No papers will be accepted that reach the registrar later than May 28.*

By Individual Approval. At the discretion of the dean of the faculty, an applicant over twenty-one years old may be admitted without examination on the following conditions:

1. He must make application on the official blank (to be had of the registrar), giving the information there desired.

2. He must furnish evidence that he has substantially covered the ground of the units required of other candidates, and that he has sufficient ability and seriousness of purpose to do the work desired with profit to himself and to the satisfaction of the University.

3. He must show, by the writing of a composition, that he has an adequate command of English.

Applicants are advised to send their applications and credentials in advance of their coming to Austin, but in no case can the application be granted without a personal interview.

Admission by individual approval contemplates applicants who have not recently attended school and are not, therefore, in a position to pass the admission examinations.

Students so admitted may register for courses other than freshman courses only with the approval of the chairman of the school concerned and the dean of the faculty, given because of evidence of special fitness.

Neglect of work or other evidence of lack of serious purpose on the part of a student thus admitted will cause the withdrawal of the dean's approval, thus severing the student's connection with the University, and preventing his readmission until he has satisfied all admission requirements.

Students admitted by individual approval can not become candidates for degrees until they have satisfied the admission requirements. As to how to remove admission conditions, see page 54.

Admission with Advanced Standing. Applicants who, in addition to satisfying the admission requirements, wish to obtain advanced standing in any school must secure, by examination or otherwise, the consent of the chairman of the school concerned, and this consent must be approved by the dean of the faculty.

Admission of Students from Other Colleges. A student seeking admission from another college must present (1) a letter of honorable dismissal; (2) a vaccination certificate; (3) a catalogue of the college from which he comes; (4) a full statement of the work he has done, including the work credited at entrance. This statement must be made out on the University's official blank (to be had of the registrar) and must be duly certified by the authorities of the student's college. Much trouble and time will be saved if the blank is filled out and certified in advance of the student's coming to Austin. Students are not allowed to register until the proper certificates are presented.

All credits given students from other colleges are conditional. If their work here is of a low grade, the amount of credit given to individual students may be reduced.

Like other applicants for admission, students from other colleges must sign a pledge to do no hazing.

Admission of Students from the State Normal Schools. Students desiring admission from the state normal schools of Texas must meet the requirements made of students from other colleges as enumerated in the preceding section.

Students who graduated from the state normal schools before 1914 will be given full admission, and, in addition, one unspecified course toward a degree.

Students attending the state normal schools during and after the session of 1913-14 will receive credit as follows:

Credit will be given only for full years of work.

On completion of the second year, students will be given fourteen and a half admission units, provided two units in one foreign language are included. If foreign language units are not included, only twelve and a half admission units will be allowed.

On completion of the third year, students will be given fourteen and a half admission units as provided for at the end of the second year; and, in addition, five college courses, provided (1) the student completed the entire second and third years at the normal school, or (2) was admitted to the normal school with at least fourteen and a half units' credit as a gradute of a school affiliated with the University of Texas, or (3) was admitted by examination covering either the second year's entire course of study in the normal school or fourteen and a half admission units accepted by the University of Texas. In case students were admitted to the third-year class with credit for only twelve and a half admission units, they will receive only twelve and a half admission units and five college courses by reason of their completion of the third-year normal course.

On completion of the fourth year, students will be given fourteen and a half admission units as provided for at the end of the second year; and, in addition, ten college courses, provided the student (1) completed the third year at the normal school, subject to the above mentioned conditions for admission to the third year; or (2) was admitted to the fourth year by examination covering the entire courses of study of the second and third years, or covering the required admission units to the University of Texas and the entire course of study of the third year; or (3) was admitted to the fourth year by reason of having creditably completed an entire year of work in a recognized college, and, in addition, presented the equivalent of full admission to the University of Texas. In case students present only twelve and a half admission units on entering the fourth year, they will be allowed only twelve and a half admission units and ten college courses on completing the fourth year.

Students, however, who were admitted to the fourth year by reason of graduation from a state normal school prior to 1914, will be credited with only six college courses in addition to the fourteen and a half admission units as provided for at the end of the second year.

It is to be noted that the course credits offered can not be specified as to subjects in advance. They can be specified only after examination of the work done in each individual case. Unspecified credits will count toward University degrees as selective courses, but will not satisfy specific degree requirements. It may result from this that a student from a normal school admitted to the University with five courses' credit will find it necessary to complete more than fifteen

additional courses in order to secure the bachelor's degree; a student admitted with ten courses, to complete more than ten additional courses.

As in the case of students from other colleges, all credits given to students from the normal schools are conditional, and may be reduced after the students matriculate in the University of Texas if their work here is of a low grade.

APPENDIX II

FEE*

No Tuition Fee. Tuition is free in all departments of the University.

Matriculation Fee. In the College of Arts and in the Department of Education and Engineering each student will pay at the beginning of each session an annual matriculation fee of ten dollars, until thirty dollars have been paid.

In the Department of Law, a total matriculation fee of thirty dollars is payable on first admission.

Medical Fee. By way of insurance against sickness a medical fee of three dollars is required of every student in residence. For this fee the student is entitled to the following services:

(1) Free consultation with one of the University physicians (men with Dr. Gilbert, women with Dr. Holliday) during office hours at the University (Main Building, first floor).

(2) If their attendance is requested by the student or his family, the University physician will make without charge at least five hospital calls and three other calls on any student who is confined by illness to his home or to a hospital, one of these three to be a night call.

(3) The ambulance or carriage required to convey a student to the hospital will be paid for out of the hospital fund.

(4) Charges for pathological examinations and for the administration of anesthetics, when made under the authorization of a University physician, will be paid for out of the medical fund, each payment to be subject also to the approval of the president of the University.

(5) Lodging, board, and nursing at a hospital for twenty-five days in case of necessity. Medicine and services of physicians other than as specified above are not included.

Library Deposit. A continguent library deposit of five dollars will be required of every student. In the College of Arts and in the Department of Education and Engineering, one dollar of this amount is retained for replacing lost and worn-out books, and for binding, supplies, and miscellaneous library expenses; in the Department of Law two dollars are retained for these purposes. The remainder will be subject to charges to pay fines assessed against the depositor, or to pay for books lost or injured. In case there are no such charges, this amount will be returned to the student at the end of the session or upon his withdrawal from the University. In case there are such

*This extract from Catalogue 1916-17, pages 64-67, gives the regulations governing the payment and return of fees.

charges, the remainder will be returned. If the deposit is exhausted before the end of the session, the student will be required to renew it.

Gymnasium Fee. A gymnasium fee of one dollar will be required of all first-year students not excused from physical training, and of all others who make use of a locker.

Delayed Registration Fee. A student who registers after the last regular registration day of any term is required to pay a delayed registration fee of three dollars.

Change Fee. A student who takes up a new course or changes a section of an old course in the College of Arts, the Graduate Department, the Department of Education, or the Department of Engineering after his first registration for the session is completed will pay a change fee of three dollars.

Diploma Fee. A diploma fee of two dollars and fifty cents is payable on matriculation for each degree for which a student will be a candidate the following June. If not paid at the time of matriculation, the amount of the fee is five dollars.

Record of Work Fee. A fee of fifty cents will be charged for a duplicate of the student's record of work for any year.

Student Activities Fee. At the request of the student body the regents have aproved a fee of six dollars and a half for the support of student activities, to be paid at registration along with other fees, but not to be compulsory. The activities covered by the fee are the Students' Association, the Woman's Council, debating and oratory, the Glee Club, the Band, student publications, and athletics. On payment of this fee a student is entitled to be admitted to all University athletic and public speaking contests held in Austin and to the Glee Club and Band concerts, and to receive the University daily newspaper and monthly magazine.

Unpaid Checks Fee. If a check accepted by the auditor from a student of the University is returned unpaid by the bank, on which it is drawn, the student presenting the check will be required to pay a fine of three dollars, and if this fine, together with the amount of the check, is not paid within seven days after notice is sent by the auditor, the student's name will be dropped from the rolls of the University.

APPENDIX III

REGULATIONS AS TO GOOD ORDER AND ATTENDANCE

Careful attention is called to the rules requiring diligence in studies and also to those governing absences and excuses.

Rolls in the respective courses will be made up as soon as practicable after the beginning of each term, after which each student, in alphabetical order, will be assigned a numbered seat which he will occupy in that topic. As far as practicable each student will be assigned the same seat in all his courses. Students coming in late will be assigned fixed seats in the order in which they enroll. After the seats are assigned, oral calling of the rolls will be discontinued. Absence or tardiness will be determined by the occupancy of the assigned seats.

Posting on the official bulletin board is deemed personal notice to each student.

Attention is called to the following regulations regarding class attendance which were passed by the General Faculty at the close of the session of 1916-1917. They can not be set aside by the Dean or Faculty of any one of the Departments.

1. **Class Attendance.** The following rules in regard to attendance at classes in the Department of Law supersede all other rules on the subject.

2. **The roll** will be taken in each class promptly at the beginning of each class period, and may be taken at any other time or times during the class period. A student who is not in his seat when the roll is taken will be marked "absent." A student who is permitted to come into the class after the beginning of the class, if he notifies the quizmaster (or in his absence, the instructor), not later than the beginning of the next class hour on the same day, will be marked "tardy." In administering these rules, every three "tardy" marks against a student in any or all classes in one term will be counted as one absence.

3. A student who is not absent more than five times during a term (taking the absences in all courses together) will not be penalized for such absences. A student absent more than five times during a term, estimated as stated above, will receive one hour of negative credit for every two absences above five, up to and including fifteen, and one hour of negative credit for every absence above that number counted as above.

4. **Excuses.** No absence or tardiness will be excused for any cause whatever, except in the following cases.

(a) **Athletic Teams, etc.** Absences due directly and unvoidably to the absence of a student from the City of Austin: (1) While en-

gaged in active participation as a member of an officially recognized athletic, debating, or other team or organization; or (2) While representing the University in some official capacity, with the sanction of the President.

(b) **Sickness.** A student so ill as to be confined either in a hospital or in his home, under the active care of an attending physician, may be excused for all absences directly and unavoidably occasioned by such illness, if he presents to the Dean or the Secretary of the Department, within six days after returning to the University a certificate from the attending physician stating the ailment with which the student was confined, the length of time during which he was necessarily confined, the number of times the physician visited the student, and that the physician in his judgment considers the illness such as properly to excuse the absence. The certificate must be upon one of the blanks prepared by the Dean. The answers to questions must be specific and must be in the handwriting of the physician signing the same, who shall certify over his signature that he has carefully read and personally filled out the blank. The Committee on Class Attendance may, in its discretion, reject any such certificate, or require additional proof; but in no case shall the student be excused from presenting the certificate in the time, form, and manner above described.

5. **The Committee on Class Attendance**, consisting of three members of the Law Faculty, appointed by the Dean at the beginning of each year, will meet to consider petitions for the excuse of absences under Section 4, only at the end of each term. The committee shall have discretion in the granting of excuses in cases falling under 4 (a) or 4 (b), and may take into account the student's previous record as to class attendance.

6. At the end of each term the Dean of the Department of Law will certify to the Registrar the number of negative credit hours, if any, to be recorded against each student. The negative credit hours will be deducted from the total number of hours of law work for which the student has received credit toward a law degree at the end of the term in which the negative credits are incurred; and such deductions, when so made, will absolve all previous irregularities in class attendance.

7. In case a student withdraws from a course, or for any other reason fails to receive credit in a course, his absences and tardinesses in that course will not be counted toward negative credits.

8. Any student enrolled in the Department of Law, whether a candidate for a degree or not, who receives more than thirty hours' negative credit in one term, will be dropped from the Department unless the Dean shall, for good cause shown, allow him to continue his work. Hearers and others attending, but not enrolled in a law class may be

requested by the Dean to withdraw from such class for persistent irregularity in attendance.

9. A student who is absent, *with or without excuse*, from as many as one-third of the class exercises in any course, will under no circumstances be permitted to take the examination in that course.

10. Under these rules, a student entering a course after the beginning of the term, will be charged with a number of abscences equal to the number of class exercises held in that course prior to his registration in that course.

Quizzes. Written hour quizzes will be given each class in accordance with quiz schedule as set out on pages 19-28 of this pamphlet. They will be given at the regular class-hour, except in the case of optional quizzes, which will be given at from 7:45 to 8:45 on the morning scheduled.

Every student must take the full number of regular quizzes prescribed in a course before he shall be eligible to take the final examination in that subject. Such quizzes must be taken at the time fixed, unless for good cause they are deferred by the Secretary. The first postponed quiz shall be to the optional, and others to special quizzes. Such postponements can be had only on account of sickness, absence from the city for good cause, or important business engagements.

Absences Without Excuse. A student absent from a regular quiz without excuse presented and approved under the foregoing rules will be graded zero on such quiz. The student can not relieve this by taking an optional quiz, but must take an extra examination in the subject covering all of the topics gone over up to that time in the current session. Such examination will be given only on the following conditions:

1. The student must apply to the Secretary for such examination during the quiz period or as soon thereafter as practicable, but not later than the next class period in such subject. A permit will be issued to the student fixing a time not longer than five days from the date of the application and a place for taking examination.

2. The examination must be taken at such time and place.

3. The grade made on this examination will be substituted for the zero given for the cut.

For further details as to quizzes see bulletin board.

Posting Notices. Students must examine the official bulletin board daily.

On the Saturday afternoon before each examination week or as soon thereafter as is practicable a statement of all those who are ineligible for examination in the various topics will be made out. A copy will be posted on Monday morning of examination week. A copy will be given to each quizmaster. No one reported as ineligible can take any examination for which he has failed to qualify. If there is error in the record the student must see the Secretay before the

examination period in the topic begins and arrange matters and obtain a written statement of eligibility. Unless he does this no examination questions will be given him nor any answers received from him or graded for him. The purpose of this regulation is to abolish the practice of permitting persons shown to be ineligible from taking examinations and having papers graded and grade "held," and then removing difficulties later on. This is an undesirable practice, leading both the faculty and students into unexpected embarrassment.

Failures in work. A student to be entitled to take examination in any law topic, must make at least 80 per cent on the quiz work in that topic. Lowest grades will not be taken off, except for Junior students in first term of their first year.

Failure to qualify for final examination, or unexcused absence from examination in a topic, is regarded as failure, and the student will be given F in the topic.

A student who fails in all his work in any one term, or in as much as one-half of his work in any two consecutive terms considered together, can not remain in the department. When a topic extends over more than one term, failure in the tests given in such topic for the first term is counted as failure in that topic for that term. In determining failure in Senior topics, the first examination and not the re-examination is considered. A student who has been dismissed from the department for failure to do his work can not re-enter without satisfactory proof of earnestness of purposes and on monthly probation.

Probation. Probation will be for a definite period, during which the student, while still in attendance upon his classes, must show marked improvement in conduct or in studies, or in both, in default of which his connection with the University will terminate with the period.

A student on probation who absents himself from any class exercise, or neglects any class work, except for imperative reasons, will thereby drop his name from the University rolls for the remainder of the term then current.

Absence and neglect on the part of such student, not explained to the Dean of his department within one day—beforehand, if possible—will be presumed to be without excuse, and will effect the dropping above mentioned.

In exceptional cases, the rule as to failure in all topics may be relaxed as to fall examinations in Junior class.

ORDER IN THE BUILDING

Any student who smokes in any of the University buildings used for instruction purposes, except in such place or places as may be

designated, or who during working hours, makes loud noises in such buildings, or defaces such buildings or their equipment, or spits on the floors of such building, shall be suspended for two weeks or more at the discretion of the President.

The middle basement room of the law building is set aside for use by students. Smoking is permitted in that room, but in no other part of the building.

LIBRARY

The books in the Library are for the use of students. In order to give equal opportunity to every student, no student is permitted to take any book from the Library without written permission from the Law Librarian.

Order and cleanliness must be observed in the Library.

These rules will be enforced by the Librarian under the direction of the Library Committee. Students violating them will thereby forfeit their right to the use of the Library.

The Regents have made a regulation that the excess of the Library deposits of the law students over the amount retained for for damages to books and fines shall constitute a fund to be appropriated as far as may be necessary to defray the expenses of extra janitor service made necessary by the culpable carelessness, or indifference, or intentional uncleanliness of any of the studets, ad also for repair of injury and damages to the Law Building and furnishings beyond ordinary wear and tear incident to the proper use of the building. These expenses, if any, will be kept out of the Library deposits as a whole, the loss being prorated among the several students. Individual students guilty of misconduct indicated as above will, as far as practicable, be made to pay for the damages done by them, such payments to be credited to the fund before the damage is prorated.

Regulation Regarding Use of English.

(Adopted March 6, 192.)

"The student must, before May 15th of his Senior year, show such ability to write clear and correct English as to satify the Committee on Student's Use of English. To promote the habitual use of clear and correct English, the written work of every student in all his courses (theses, reports, quizzes, examination papers, etc.) is subject to inspection by the committee. It is the duty of each member of the teaching staff to require that his students shall be caremul in their use of English, to give due weight in the making up of grades to the student's use of English, and to report promptly to the committee, submitting the evidence, any student whose use of English is seriously

defective. Each session the committee will pass on the written work of every student above the rank of Freshman. If any student be found deficient, the committee will prescribe for him such work as in its judgment is proper, and this work must be done to the satisfaction of the committee before the student can obtain his degree."

BOSTON PUBLIC LIBRARY
3 9999 06440 631 5

NOV 27 1918